PUBLISHED WEEKLY

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—42ND YEAR SYDNEY, SATURDAY, APRIL 9, 1955 No. 15

Registered at the G.P.O., Sydney, for transmission by post as a newspaper.

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Table of Contents.

GROUP PSYCHOTHERAPY.[1]

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MODERN group psychotherapy, with its attempts to study and utilize concepts of group dynamics, dates from World War II. Previously it was practised sporadically, chiefly in lecture discussion form in America. An exception was the method of Paul Schilder, who employed a psychoanalytical approach, training the members of his groups of seven or eight in free association. Earlier in the 1920's Alfred Adler used group techniques with children. The war, with its wide incidence of personality disorders and relative scarcity of psychiatrists, gave added impetus to the application and further development of methods of group therapy. Again the Americans were first to exploit the field.

In regard to the effectiveness of the method, most patients who persevere report improvement in their outside social relationships. Whether this is due to radical changes in underlying dynamics or to a better compensation of an unchanged neurotic substructure remains controversial. So far in the literature I have not come across any ratings or test studies carried out before and after treatment. Because of the limited opportunity for the emergence of unconscious childhood material, many critics suggest that benefits are confined to offering support, to education in social intercourse, to strengthening ego defences through intellectual discussion of conflicts, defences and transference situations. However, group therapy, by providing many emotionally charged situations characterized by hostility towards therapist, group members and resistances, seems to offer opportunities for reorganization of adaptive patterns which may have a degree of permanence in replacing old ineffective defences. In contrast with the psychoanalytical method which aims at eradicating the basic conflict, Cameron has stated that a "therapy to be successful does not necessarily have to deal with the primary cause, but needs only to be capable of interrupting in a constructive manner an undesirable train of events".

It is a matter of common experience that personality behaviour tends to be modified in a crowd. Pederson-Krog points out that when an individual becomes part of a group the unconscious tends to dominate the conscious; suggestibility increases, suggested ideas become acts, the critical faculty is decreased and the individual feels stronger motivations.

The methods of conducting group psychotherapy are many and varied, and include such diverse procedures as the following. Various psychoanalytical approaches are used, themselves widely differing, but attempting to apply the dynamics of the variants of individual psychoanalysis

[1] Read at a meeting of the Section of Neurology, Psychiatry and Neuro-surgery of the New South Wales Branch of the British Medical Association on November 4, 1954.

to the group process. Thus Foulkes (1952) summarizes Ezriel's method as one which sees the group as "a constellation which corresponds to the inner object relations of its respective members", and therapy consists of interpreting these transference relations. Another representative of this school, Kraupl Taylor, deals with three kinds of relationships in the group: (i) interpersonal relations, (ii) what he calls "public relations"—that is, between each patient and the group as a whole, (iii) patient-therapist relations.

Other group therapy methods include the following: (i) eclectic analytical methods; (ii) repressive inspirational methods; (iii) the leaderless group method, developed particularly by Kelley in America and by Bion in England; (iv) the activity group method of Slavson. This was developed for children aged between eight and fourteen years, and utilizes the acting out of conflicts in handling a specific environment consisting of simple tools, craft materials, games and food. The leader plays a comparatively passive role and helps the members in their activities when they need or ask for it. He does not participate in interpersonal conflicts.

In Slavson's method, therapy occurs largely through the promotion of a polarity of hyperactivity, and quiescence through inclusion of what are called instigator and neutralizer members. The former activate the group and promote tension release, and the latter consolidate therapeutic gains by bringing the group under social control. It is possible that this principle may have future application in adult group therapy.

Cahn in a preliminary study reports on an interesting adjuvant of group therapy in the form of drugs. He studied the effects on group therapy of caffeine, "Benzedrine" and barbiturates. He concluded that both "Benzedrine" and barbiturates stimulated group interaction and discussions. Barbiturates were preferable, as "Benzedrine" tended to bring out more aggression than was therapeutically helpful.

The method I am trying is an eclectic analytical method derived from Powdermaker and Frank.

For success, group therapy requires the promotion and maintenance of free interaction between the group members, and between the group members and the therapist. The special type of interaction necessary is hindered by social contacts and friendships between the members of the group, and these are discouraged at the outset. Selection of the group is difficult, but avoids the inclusion of any member whose status or personality characteristics stand out conspicuously from others. In practice I include the following types of patients. (i) Those who cannot form a strong positive transference in individual therapy. This is often born of hostility to an original parent figure and seems to be diluted by the group. (ii) Poor verbalizers, who in an atmosphere of acting out their problems in a group setting can often be educated to evaluate their own conduct. (iii) Naïve and self-unaware individuals who, when they hear other people discussing personal problems, tend to experience highlighting in their own consciousness, when ordinarily they lack the facility to reflect on their own attitudes, experiences and personal relationships. Some individuals need an intermediary for self-recognition. (iv) Rigid intellectualizers, who in individual therapy experience little emotional stir-up or provocation from their verbalizations.

A group consisting exclusively of the foregoing types of patients in the early stages is usually too static for effective group interaction, and tends to be diverted into a discussion group with little therapeutic achievement. To obviate this I try to include a number of more flexible personalities to activate the group.

The group having assembled, a basic working agreement is made. A formula such as that of Standish is useful. It is explained that the group meets for purposes of discussion of everyday problems and difficulties, and that in the group each one may get some ideas that may help him or her in their efforts to understand current difficulties. Each member is asked to contribute to the best of his or her ability, and the therapist wishes to have the privilege of contributing only when he feels it will be useful to the group.

Powdermaker and Frank, by studying a number of groups under leadership of different therapists, have formulated a general picture of the evolution of the group with the development of three stages.

1. There is the first or orientation and testing period. In this members are more concerned with what they feel are the therapist's attitudes than with those of their fellows. The members react to each other with their habitual patterns; that is, the man accustomed to leading assumes a leadership role, the submissive person is deferential. There is a low tolerance for tension with a retreat into superficialities, and patients project their feelings on others.

2. In the second stage patients learn the methods of group therapy by trying them out. Topics about which they feel sensitive are taken up for discussion—tension becomes more closely related to group interactions. Patterns of relationship fluctuate sharply, with intense but brief and brittle linkages, and sharp reversals of feeling. Misunderstandings are frequent. The more insecure members may drop out. The main task of the therapist at this stage is to keep tensions from rising beyond members' tolerance.

3. In the third or therapeutic stage the group becomes integrated and is accepted by the members as a therapeutic agent. The patients have confidence that their real selves will be understood and accepted by the group, and are convinced that they can get help from it as well as from the therapist. Behaviour is determined less by the members' previous values than by the values of the group itself. Tolerance of tension is high, without haste to resolve or escape from it. Members in the early stages frequently avoid their own problems in a variety of ways—for example, by attempting to protect others from seeing the implications of their exchanges and productions and by proceeding to offer them rationalizations. However, in this stage the therapist is chiefly concerned with promoting therapeutic interactions among the members and furthering their self-analysis.

What are the Advantages of Group Over Individual Treatment?

In neurosis, adaptation is less determined by the needs of the present than by emotional investments from the past. Psychological analysis aims to activate and render conscious the forgotten noxious and infantile and childhood past, so that the exaggerated emotions may be experienced in their original setting and the present reappraised free from distortions from the past.

How Does Therapy Activate the Past?

The emergence of affectively charged material, particularly that of noxious quality, including that relating to the therapist in transference, is used as a feed-back stimulus for the abreaction and recall by association of the forgotten past. Individual analysis may be handicapped or reach an impasse. If the neurotic is sealed off from the stimulus of affectivity by a closed intellectual defence, no emotional material emerges to provide the feed-back stimulus to activate the past, so that treatment hardly commences. In a group the first breach in the defence of the rigid intellectual often comes from the explosion of pent-up irritation by a long-suffering fellow member. Such a stimulus is not available to the therapist, because he already carries a partial emotional investment of a bad object figure from the past, which would then be reinforced and also prejudice withdrawal of this projection, which would be felt as warranted by his present behaviour.

Group therapy offers special advantages for stimulation. Frank and Ascher clarify the position in regard to individual and group therapy. In individual treatment "the main stimulus for attitudinal change lies in the doctor's activities, or rather what the patient perceives them to

be. Opportunities for this stimulation are limited in individual psychotherapy by the fact that the doctor-patient relationship is one of special favour, insulated somewhat from the reality laden struggles of everyday personal interaction. In the group setting competition for the doctor, struggles for status, differences in background and outlook among patients, transference reactions to other group members, and so on, afford ample opportunity for the activation of noxious attitudes."

Such noxious stimulation frequently results in due time in the development of a critical situation in which old patterns become disrupted, with an opportunity for new ones to form in an atmosphere of group understanding and support. Such crises of constructive disruption Frank and Ascher call "corrective emotional experiences". It is, of course, necessary to prevent a noxious stimulus from becoming a traumatic stimulus and the alleviation of such a potentially unfavourable situation is part of the task of the therapist. In individual therapy considerable time-consuming evasion may occur as the patient talks about difficulties with other people; but in group therapy he becomes emotionally involved with other group members, which is a different matter.

Frank and Ascher also emphasize the opportunities of group therapy for reality testing. The relations of neurotic subjects with contemporaries suffer from a carry-over of disturbing experiences with people in their past. In the permissive atmosphere of uncovering psychotherapy the patient revises many of his attitudes. However, in this one-sided and artificial relation the subject may remain uncertain as to how others will react. The possibility of facilitating the correction of inappropriate attitudes is provided by the therapeutic group which, again to quote Frank and Ascher, "in contrast to the private interview, is more like society in miniature. Members of the group may be representatives of types of people with special meanings for the patient. A worker having difficulty with bosses, for example, may in a group be exposed to other workers with attitudes similar to or divergent from his own, and to employers as well, and thus be enabled to test his attitudes with both groups on the spot."

In psychological analysis the therapeutic work is achieved through the patient becoming aware of painful subjective realities he has hitherto striven to ignore. This process involves an alteration of personal values and interests, but provides no way for their implementation in practice in a social setting. Just as the immature child needs adequate parental and authority figures as an ego ideal to imitate in mastering new situations, it seems logical to assume that the ego modified by analysis often temporarily requires a new ego ideal for learning identification. In many an individual treatment the renunciation of neurotic ego ideals and defences may be difficult, because under the comparatively stereotyped and anonymous conditions of the process the therapist remains a shadowy figure and unable to meet the requirements for a new ego ideal for learning. Therapist activity in the way of expressing opinions and values can readily be misunderstood as protection or direction, or may encourage narcissistic identifications. In a group setting counterfeit maturity is readily unmasked by the subject's peers. A group ego ideal tends to develop as support and prestige go to those members who are sincere in trying to understand themselves and successful in helping others. For therapeutic benefit the individual must value his group membership.

A few further advantages of group therapy may be mentioned. Some individuals with excessive anxiety from self-confrontation in individual therapy may be helped in a group with vigorous interaction between its members. In the group these anxious patients at first continue to withdraw from active participation. They become spectators; but therapeutic processes are still active in some degree because they can identify themselves with others in the group who express problems similar to their own and then apply interpretations to themselves. Moreno referred to this as "spectator" therapy.

Group therapy focuses such interpersonal relationships as sibling rivalry, which can often be partly evaded in individual therapy. Again, temporary paranoid activation, which often occurs in individual therapy, and which may cause prolonged hold-up, may be resolved in a group. Distortions of reality become less tenable in the presence of a number of appraisers.

The foregoing account has been concerned with group therapy in neuroses. The method has also proved its usefulness in the treatment of psychotics. I have had no experience in this field of group therapy and will confine myself to brief reference to some of the literature.

Understandably, in the early stages and for a prolonged period, the therapist in psychotic groups assumes more active leadership and emotional support of members than in neurotic groups, and does more steering. There is a distinctly educational tone in the early meetings, with correction of misconceptions held by patients on the subjects of sex, including the topics of masturbation and homosexuality. Explanations of hallucinations and delusions are given. Those with experience in the method (Ross, Abrahams) report a loosening and decreasing use of delusionary systems under the influence of emotional support from the therapist and the social pressure of others in the group.

At this stage we might inquire as to overall theoretical formulations of the mechanisms involved in the varieties of group therapy. Dreikurs and Corsini have studied the literature extensively, and report a general lacuna on this crucial issue. They have suggested the following eight mechanisms as a basis for further study.

1. Effectiveness of group therapy depends on the participation of the group members. Lecture methods are largely ineffective.

2. The effect of public disclosure is comparable with open confession employed at different times by various religious groups. This mechanism is like catharsis in individual therapy, with additional "feed-back" effects.

3. In universalization, a remark of one member strikes a common chord in the others, and facilitates identification and group cohesiveness. Tensions are reduced, and there is a feeling of "belongingness" and increased understanding of the problems of others.

4. From the educational point of view, in the group there seem a lowered defence to accepting new ideas and an unconscious incorporation of previously unacceptable ideas.

5. The effect of members helping each other tends to dissolve emotional isolation.

6. Social reality testing has already been described.

7. The group acts as a healing medium, in which deficiencies lose their stigma, and do not lessen social status but confer an equality on all.

8. The group acts as a value-forming agent. The normal group experience of an adult is limited in its capacity to penetrate his already well-established value systems. The strong emotional social experience of a therapy group is highly potent in influencing personal values.

Let me add three further speculations as to mechanisms of group therapy.

Firstly, group treatment may provide a corrective therapy of the self-image outreaching the scope of individual methods. It may be that in the study of the dynamics and treatment of neurosis insufficient attention has been given to the part played by the over-emphasis or devaluation and even distortion of the self-image. The work of Machover with her various drawing techniques, including the "draw a figure" test, suggests that the self-image is a legitimate conceptual entity. It may be that one of the obstacles in the treatment of stammering is the rigidity of the sufferer's projected self-image of himself as a confirmed stammerer.

Secondly, as was mentioned above, Pederson-Krog and Dreikurs and Corsini have suggested that in the group

there is a tendency for the unconscious to dominate the conscious and resistance to accepting new and even alien ideas is lowered. It seems that in a group the habitual personality *Gestalt* or equilibrium undergoes a sort of rearrangement. Perhaps this new *Gestalt* has an added accessibility to psychotherapeutic impact.

Thirdly, by means of opportunities for objectification by projection, identification and empathy in the group, the patient's ego is able to achieve an appropriate working distance from its emotional difficulties which may promote the therapeutic process of "working through".

Rümke, of Utrecht, uses the concept of ego distance in speculating on the explanation of favourable results of leucotomy in compulsion neurotics. He suggests that "a greater distance separates the inner events and experiencing Ego and this distance makes life more bearable".

But to return to ego distance in psychotherapy, one imagines that not a few individual treatments founder almost at the start because of the patient's panic from too close involvement of ego and affect in some cases, and in others through an almost complete introspective naïveté preventing any confronting between ego and emotional experiences. The road to insight and assimilation for both types may be a screen such as the group, to accommodate projections.

Ideally, psychotherapy should meet a twofold requirement: on the one hand to help the patient realize his assets, to become a real person or to achieve individuation, as Jung would say; on the other hand, to assist in the removal of liabilities. Perhaps if these latter cannot be liquidated they can often be reduced to less menacing proportions. It may be that group treatment has a special function to be exploited in helping secure this result.

By the confronting of a "boss" figure in a group, with the opportunity to "chip and dig" him, and particularly to view him as a person also harassed by problems, the original terrifying father image, which may have dogged the individual's life and been projected in symptoms, tends to be cut down to size by such objectification.

Conclusion.

In conclusion, let me illustrate this point further by quoting the summary of a play of Maeterlinck's called "The Betrothal" (a sequel to "The Blue Bird"), given by my old friend and teacher Dr. John R. Rees, formerly of the Tavistock Clinic:

> In that remarkable fantasy the hero meets all kinds of difficulties and alarming situations, and all the way through he is dogged by the figure of Destiny, a gigantic, grotesque and alarming shape in the first scene. Then, as act by act and scene by scene, he is led by the figure of Light, he goes through various experiences—back to his ancestors, and on to his children-to-be,—gaining more and better insight and experience, the figure of Destiny becomes smaller and smaller in each scene. At the last, Destiny appears on the stage, this time as a tiny doll-like figure, still saying: "I am Destiny, immutable", and the hero picks the figure up in his arms like a doll and says: "There, there, that's a good boy."

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PSYCHODRAMA.[1]

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THE subject of psychodrama has recently come into the focus of attention in psychotherapy. One should be aware of the difficulties in relation to the subject, which is controversial, new in approach and perhaps unorthodox. It seems advisable therefore to hide under the wings of the more accepted group psychotherapy. Psychodrama is one of the methods applied in group psychotherapy, and is a group therapy in a special setting and with the use of a special technique. The main difference lies in the methodology, and the dynamics operating in a group apply to the psychodrama as well. I shall mention a few differences of these dynamics.

In the present paper the subject is discussed under the following headings: historical review, definition of the method, psychodrama versus psychoanalysis, methodology, indications, therapeutic effects, dynamics in operation.

Historical Review.

In *Hamlet* the player king and the player queen act before the real king and the real queen, depicting the poisoning of Hamlet's father. This is a psychodramatic approach and Hamlet is the therapist himself.

Psychodrama is connected with the name of Dr. J. L. Moreno. As early as 1911, in the gardens of Vienna, children were encouraged by him to act out their phantasies on a fairy-tale level. This so-called spontaneity theatre was then used for mental patients and later taken to the United States by Moreno himself; there the first theatre was established for this purpose, at Beacon, New York, in 1936. Four years later another theatre was built at Saint Elizabeth's Hospital in Washington, and used for the rehabilitation of ex-servicemen. The third theatre was opened in 1942 in New York City at the Psychodramatic Institute. This institute is becoming more and more active, producing its own journal, *Sociometry*, and publishing psychodramatic monographs. There are several psychodramatic theatres in development in England, the main working at Belmont, Surrey, under Maxwell Jones and his unit. As far as we are concerned, a psychodramatic theatre is conducted in Melbourne in the rehabilitation centre at Rockingham. This centre is under the Repatriation Department, and is conducted by Dr. R. S. Kennedy, Dr. H. Whitaker and Dr. G. Christie. The advantage of this centre is that patients are specially sent there for this treatment and form a community with common incentives. There is no organized psychodramatic activity in New South Wales. Several mental hospitals have their own theatres where patients act, but they are not used in a directive way.

Definition of the Method.

Of the arts, drama is considered superior to all forms of expression. It combines the lyric with the epic and provides the most powerful mode of expression. According to Aristotle, the pity and fear induced by a tragedy purge and purify the soul of the spectator. The word catharsis means abreaction, and appeared in literature first in connexion with the Greek drama and not in connexion with

[1] Read at a meeting of the Section of Neurology, Psychiatry and Neurosurgery of the New South Wales Branch of the British Medical Association on November 4, 1954.

psychotherapy. In psychodrama a dramatic situation enables the patient to put himself into action and to act bodily and mentally his crucial problem. Psychodrama is both a group therapy and a projective technique. As far as group therapy is concerned, it uses the same dynamics as in group settings. Instead of being isolated the patient is in a community. The interpersonal dynamics operate fully. There are, however, differences between psychodrama and group psychotherapy. The first difference is that in both group transferences and interactions are used, but in psychodrama the bodily expression plays as large a part as verbalization, or larger. The other difference is that in psychodrama a miniature society is split in two—the actors and the audience, the giving and the receiving part. We know that "give-and-take" attitudes are of great importance in interpersonal relationships. This attitude is accentuated in psychodrama, and every person can move freely from the give level to the take level and *vice versa*. Psychodrama is a therapeutic situation similar to the social situation of the patient. It is a special type of group therapy, and it is unnecessary to say that every form of group therapy will use psychodramatic tools like reading a play, enacting a situation or performing a part.

Besides being a group therapy, psychodrama is linked with another method in psychiatry and psychology. It is a projective technique. Projective techniques are used mainly for diagnostic purposes. They were used recently also for therapeutic purposes. It seems advisable here to give a short review of this method and the place of psychodrama in it.

The first projective method is the word association method of Jung. It is the most primitive projective technique. It uses verbal stimulation by a conflict word and the response word is a projection of patients' conflicts. The other projective methods use visual stimulation, and the two important ones are the Rorschach test and the thematic apperception test. The first test emphasizes the methods of perception; it is mainly concerned with how the patient perceives and organizes the perception of ink blots in form, in colour, in movement. It minimizes the imaginative content which is stressed in another projective technique, the thematic apperception test. Here the patient chooses a figure in the picture with whom he identifies himself and organizes this person's position in the social environment. The person's basic needs and social constellations are in this way revealed. The projection stimulus is two-dimensional—it is a picture; but the response is three-dimensional.

Other projective techniques use the third dimension and investigate the subject's plastic involvement.

In the "make-a-picture story" test we have a representative of this technique. Figures representing auxiliary egos and other representatives of society have to be arranged against a background representing a bedroom, a workroom, a street, a cave, and so on.

The techniques using the third dimension, the so-called plastic projective techniques, recur in play analysis with play and "Plasticine" as used by Mélanie Klein. She places the subject in a play situation, and the imaginary content produced during the play is used as a substitute of free associations. Another plastic three-dimensional projective technique is the use of puppet shows, as by Bender and Woltman. A drama is presented and the end of the play determined by the audience.

We are coming nearer now to the psychodramatic projective technique. The stage is set, the actors are missing and soon the bodily projection and identification will take place. We can conclude now that psychodrama is both a projective technique and a group psychotherapy with all dynamics involved. As far as the projective technique is concerned, psychodrama uses all techniques of a projective method simultaneously. It uses the imaginary content, as in word association and the thematic apperception test. It uses methods of perception as in the Rorschach test. It uses plastic involvement as in three-dimensional "make-a-picture story" tests, play techniques and puppet shows, and finally it uses a social setting which is exclusive to this psychodramatic technique. So psychodrama contacts all these four areas—imaginary content, perception, plastic tridimensional involvement and social settings.

Relation of Psychodrama to Psychoanalysis.

Although psychodrama uses as any other phychotherapy the tools of psychoanalytical interpretation, it is far remote from the psychoanalytical methodology. It could even be said that it uses a methodology diametrically opposed in every point. The psychoanalyst places his subject in a darkened room on a couch and expects him to give a verbal projection of how he behaves in life. The psychodramatist places his subject in a miniature society and asks him to project his behaviour bodily. The psychoanalyst will trace the patient's present conflict to a traumatic situation years ago and will try to bring the past moment to the present life. The psychodramatist will start with a warming-up process of an everyday situation and will then try to bring it back to a past conflict. The psychoanalyst will make no attempt to stimulate production; his approach will be non-directive. The psychodramatist will provoke a situation and patients' productions and acts usually in a very directive way. Finally, the psychoanalyst will not treat, or will treat with reluctance, narcissistic states in which the transference cannot be established or is established in an unsatisfactory way. The psychodramatist will approach narcissistic states whether neurotic or psychotic. The psychodramatic principle is to create an imaginary reality, and the patient is able to project his ego into auxiliary egos and into a situation created by himself, on an interpersonal level. An auxiliary world is built around him and he does not require the transference situation.

To summarize: The main difference between the two is that the psychoanalyst studies his patient in isolation; the psychodramatist does so in a social matrix.

Methodology.

Two main approaches are used in the psychodramatic activities today: (*a*) experimentally constructed situations, and (*b*) dramatizing of patient's suggestions.

The experimentally created situations are usually based on a case history. The patient's life history is checked and rechecked, and one or more conflictual and dynamically important situations are chosen and dramatized with the help of staff members or professional actors. The patient is encouraged to take part, criticize and interrupt the performance. He is also encouraged to replace any of the actors, choose his role and enact it. Even if he does not do so, he still will probably abreact by witnessing his own problem dramatized, given bodily shape and brought to the surface from the back of his subconscious knowledge. It is like viewing an old family photograph. It is, of course, more than that. Other patients are present too. Their life situations and pasts may fit in with the one dramatized; they may join in and take part as well. There is created immediately a feeling of support. It is easier to suffer when in a group, it is easier to accept things when in a group, and perhaps it is easier to project if suitable objects are at hand.

The other method used overseas is to dramatize patients' suggestions on the spot. No previous preparations are made; the patient is encouraged to act, the only directions given to him being with reference to the subjects and objects he should use in the play. We may leave the patient alone and let him soliloquize or send in an auxiliary ego or egos. We may let him go through a series of standardized situations; but they are standardized only with reference to other persons and objects introduced. There is, however, no standardization of action. He can act as he chooses.

The standards introduced by Moreno, del Torto and Cornyetz may be stated as follows:

1. The patient *plus* an imaginary person. He will invent this person and create a relationship with her. We get a hint in this way of what social relationship means to him and how he communicates with others.

2. The patient *plus* an imaginary person and an object. We can study here cooperation and competition with reference to the object, whether he shares it or monopolizes or surrenders it.

3. The patient and three objects. We study his choice, his interests and needs.

4. The hidden situation theme. The patient walks in while the situation is in progress on stage. His spontaneous adaptation to surprise is tested.

5. The mute situation: the patient *plus* an imaginary person. Action without verbalization is requested. We test here the patient's physical resources for communication and the bodily expression.

6. Triple situation. The patient is put in three situations which are developing one after the other for a controlled time. The patient's flexibility and other adaptabilities against his inertia are tested.

7. The descriptive situation. The patient is alone. He has to verbalize the situation in a life-like manner. He may act for himself and for others. His adaptability is tested as well as his ability for perceptive functions.

8. Substitute role technique. If the patient does not want to enact his own problems, he is encouraged to enact the part of a close member of his family. On this occasion he will usually display features of his personality or family conflicts with which he was involved.

9. Mirror technique. An auxiliary ego acts the role of the patient. An actor plays the patient's part, but the patient is put outside the scene and observes his ego playing the part.

10. Projection technique. The patient's conflict is played on the stage by other figures. He can project into it as much as he needs. He can interrupt the play or substitute any of the figures. This recalls *Hamlet*.

11. Technique of role reversal. The patient plays somebody and somebody plays the patient.

12. Symbolic distance technique. A far-distance role or scene is played first, to encourage the warming-up process. In other words, the conflictual situation is avoided for the start.

13. Double ego technique. In the permanent conflicts of obsessional neurosis and in the split personalities of schizophrenia the double ego is played by two persons. The auxiliary ego takes over the part played by the superficial ego, how it manifests itself in everyday life. The deeper ego permanently torturing the superficial ego is played by the patient himself.

In the foregoing two methods of psychodrama an experimentally constructed situation based on the patient's history or the patient's dramatized spontaneous suggestions was used. There is no planned operational procedure, and there is no set content of figures and themes. The patient is faced with objects, persons or situations, but he is not told what objects, what persons and what situations. It is left to him. In the foregoing two approaches in psychodramatic therapy the technique was based on bringing into the focus of attention the patient and his own history. It is obvious that the scene varies from case to case and has to be recast on each occasion, and there is no possibility of developing a standardized technique.

Modified Methodology.

In the following an attempt has been made to work out a method which could be used for standardization purposes. The fact had also to be considered that in the approaches used by others technical difficulties would arise when the method had to be applied to patients outside mental hospitals. The number of participants requested for each session and the amount of work involved in casting each session would preclude the method from practical use. The method described here is in a very experimental stage; I am not sure whether the avenue of approach is correct, and I am only too anxious to hear criticism of it.

A play was chosen which contains the basic conflicts occurring in every psychoneurosis. The dynamics referred to are a four-corner relation of a family of four—mother, father, son and daughter. The play chosen was "Mourning Becomes Electra", by Eugene O'Neill. From this play several situations were chosen: (i) an Œdipus complex (Orin against his mother Christine); (ii) an Electra complex (Lavinia against her father Esra); (iii) sibling rivalry (between Lavinia and Orin). The playwright shows a great insight into the working of the mind under stress. Lavinia is the daughter who displays a great affection for her rather Esra Mannon, together with hate for her mother Christine. This conflict is depicted and verbalized in a way everybody can understand—the love of Orin, the son, for his mother Christine, and the rivalry between brother and sister. Orin and Lavinia provide another masterpiece of verbalizing this conflict without using the scientific jargon. The scenes of importance were played by professional actors and recorded. They were used later as a set of standardized situations of a stimulus-producing quality. A group of patients was present and was invited to continue the action of the sketchy situation or to interpret the situation. The scenes are of short duration, about three minutes each, and are preceded by a description of the person or persons acting, and they form a standard set of situations as used in the thematic apperception test. As soon as the record is played to the patients, the psychodramatic session goes on in the group.

The differences between a psychodramatic session and a standard group session should be pointed out here:

1. There is a verbalized stimulus which starts the group and helps the group to warm up. The stimulus is standardized and the same stimulus is used in every group.

2. Any patient may respond in any way he likes provided that he acts. He must stand up and his verbal expression must be accompanied by bodily expression. In other words, he must act. It is frequently very difficult to overcome the patient's shyness for starting movements, but there must be movements as well as words. We shall refer here to the concept of non-verbal psychotherapy which should form the first step in any psychotherapy. The methods of expression in bodily movements and facial expression on the part of both therapist and patient play essential parts. They may not play an essential part in psychoanalytical technique, in which the patient is bodily immobilized; but even psychoanalysts use the play technique with children, in whom they observe the bodily expression. We shall therefore invite the patient not only to talk, but also to move, and we represent here the behaviourists' point of view.

3. The patient is asked and encouraged to talk, not in a descriptive way like telling a story, but directly, as though he or she were the person whose ideas he or she represents.

4. The patients are encouraged to say in the beginning who they are and to introduce themselves. This technique is used in Chinese plays. They are at times able to show spontaneously a characteristic of their personality, showing insight of which they had never given evidence in a straight-out interview.

More plays are being tested for their capacity of representing common personal and social problems.

Indications.

The experience with the foregoing techniques is limited. There is no doubt, however, that groups of patients who display difficulties in ordinary interviews will be more at ease in a psychodramatic situation.

Patients of narcissistic type, who most probably display social insecurity arising out of the narcissism, will be the most suitable. They will be followed by patients whose conflict lies on the surface and who, in spite of the conflict, cannot solve it. They are followed then by the so-called intellectual psychoneurotics, who exhaust themselves and the therapist in endless talks and domineering attitudes. Needless to say, patients of hysteroid type will be only too happy to take part, and of course the result will be nil.

For hysterics both group therapy and psychodrama are contraindicated. They will help sometimes to get a group to work, but have to be excluded later. I have had no experience in treating psychotics by psychodramatic approach. Many of them have been treated in the United States of America. The treatment can proceed even in those narcissistic states in which transference is negligible or absent. The patient is able to project his psychosis in the form of delusionary or hallucinatory roles. He can see his psychotic experiences made objective and rounded out. The world of reality has become unreal to him, and the new imaginary world becomes by necessity an anchor for him and a secondary reality. He can be kept by auxiliary egos within the bounds of psychodramatic imaginary realities. It becomes an auxiliary world to which the patient can return at later stages in his treatment. The psychotic conditions in which this form of treatment is indicated are all those in which transference from the patient to the psychiatrist is absent or negligible. In the paranoid types of schizophrenia the indications are strongest.

In summary then, psychodramatic treatment is indicated in all cases of social maladjustment, social neurosis, character neurosis, obsessional and compulsive states and some forms of schizophrenia. It may also be indicated in borderline cases which we see so frequently, such as problems of childhood or adolescence, problems of marriage and family adjustments.

Dynamics in Operation.

The psychodramatic treatment produced also a psychodramatic theory represented by Moreno and his followers. It is too early to judge whether the theory is correct, and one should also avoid the mistake made by the psychoanalytical movement in being too dogmatic. However, some aspects of interpersonal relationship should be stressed here, as they may apply not only to the type of treatment proposed, but also to broader areas of social adjustment. According to Moreno, a normal person does not participate constantly in the reality of other persons, and escapes frequently into the world of imagination, phantasy and dreams. We would perhaps even be able to say that an average normal person spends more of his lifetime in a dream world of his own than in reality with other people around him. These rhythmic changes are the fundamental patterns in a normal person. The same patterns repeat themselves in the neurotic and psychotic. The gradation only determines one's opportunity to escape into an authorized world of phantasy.

Another point of dynamic value is that every human being enacts during his lifetime a certain number of roles. Any role, after it has served its purpose, disappears and is replaced by another role. So as time goes by there is a dynamic sequence of roles, which are usually linked with previous roles only for a certain time until they free themselves and operate alone. A new role, with time, may become another pattern for another new role. Psychoanalytical investigators say that the most important role is the role in early infancy, which operates like a compulsion and dominates subsequent roles in life. This theory seems not quite correct. Interpersonal relations and successive roles acquired through situational factors and conflicts arising out of present life situations seem to acquire more importance in the light of recent investigations.

Summary and Conclusion.

The technique presented in this paper is a type of psychotherapy. The value of projection into three-dimensional space has been emphasized. Plays with a conflictual situation have been chosen, and an attempt has been made to work on one or more standardized plays. The importance of interpersonal relations has been stressed. The differences between the new sociological approach and the psychoanalytical school with its early infancy approach have been stated. The psychodramatic method has been described in its application, and a modification of it has been suggested which would save involvement of many persons and would still serve the purpose.

Psychotherapy should be conducted in a manner strongly linked with everyday life and should be free from the mysterious effects of darkened rooms. Drama has its place in psychotherapy, and we shall never forget that actually the Greek drama was first and psychotherapy only second. This paper has been written in order to stimulate criticism.

Acknowledgements.

I am most indebted to Miss Doris Fitton, Director of the Independent Theatre, for drawing my attention to this play, and to her and her staff for playing the parts chosen. I am also indebted to the Council of Adult Education in Victoria for selecting plays and supplying copies of them. My thanks are due to Dr. C. Radeski for reading the proof and for his advice.

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A REPORT ON THE HELLIGE HÆMOSCOPE.

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BLUM (1953) has discussed the present status of photoelectric methods of red cell counting in humans, and concludes that the minimum requirements of such a method are (i) simplicity of operation, (ii) accuracy and (iii) compensation for cell size over a range of approximately 7μ to 9μ. A recent appraisal by Brackett *et alii* (1953) of the Hellige hæmoscope, which aimed at meeting all these requirements, indicated that the first two were adequately met and that cell size was compensated for within the range 7·2μ to 8·4μ. However, these workers did not estimate the importance of such sources of variability as day-to-day variation and differences between operators. Further, there is a field for such a machine in work on animals other than man, where cell size falls outside the range of compensation; it is therefore necessary to test the linearity of measurement over a complete range of cell counts.

Materials.

Citrated human blood was supplied by Dr. R. J. Walsh, of the Red Cross Blood Transfusion Service. Sheep red cells were obtained by taking blood from the jugular vein into glucose citrate solution. All dilutions were made with freshly prepared filtered Hayems solution. An improved Neubauer hæmocytometer was used for visual counting.

Experimental Investigation.

Using human blood, two operators counted in duplicate, both on the machines and also by hæmocytometer, three samples of different cell concentration on four different days. Each sample was initially divided into 32 subsamples, each of which was allotted a five-figure number

taken from the random numbers tables of Fisher and Yates. Two groups of sub-samples, each comprising two sub-samples from each sample, were allotted to each operator each day, one to be counted on the machine and one by hæmocytometer. Sub-sample counts were identified at the end of the experiment by recourse to a key to the random numbers. The precautions taken to ensure randomization are necessary to eliminate bias.

All counts made are tabulated in Table I, and their analysis of variance is set out in Table II.

TABLE I.
Cell Counts.

Day.	Operator.	Sample. I. Hæmocytometer.	Sample. I. Machine.	Sample. II. Hæmocytometer.	Sample. II. Machine.	Sample. III. Hæmocytometer.	Sample. III. Machine.
1	A	6·03	6·85	4·13	4·50	2·17	2·65
		6·36	7·15	4·18	4·40	2·47	2·65
	B	6·13	7·72	4·71	4·85	2·29	2·78
		6·53	7·60	4·32	4·63	2·40	2·79
2	A	6·52	7·70	4·38	4·58	2·88	2·68
		5·84	7·45	4·10	4·60	2·71	2·70
	B	6·51	7·60	4·31	4·68	2·43	2·71
		5·84	7·60	4·91	4·68	2·72	2·70
3	A	5·83	7·55	4·43	4·48	2·27	2·73
		5·97	7·10	3·84	4·58	2·05	2·65
	B	6·34	7·58	4·71	4·71	2·79	2·77
		6·14	7·58	4·58	4·63	3·00	2·75
4	A	6·18	7·10	4·08	4·45	2·74	2·65
		5·87	7·10	4·29	4·35	2·19	2·68
	B	6·57	7·20	4·55	4·73	2·73	2·78
		6·35	7·62	4·58	4·78	2·81	2·78

The mean size of sheep red cells, 5μ (Dukes, 1947; Brackett *et alii*, 1953), is outside the range of compensation of the machine, which results in a reading lower than the actual count. Sheep red cells were selected for testing the linearity of measurement of the machine over a range

TABLE II.
Analysis of Variance of Cell Counts.[1]

Source of Variance.	Degrees of Freedom.	Mean Square. Hæmocytometer.	Mean Square. Machine.
Between samples	2	53·2185***	89·1318***
Between days	3	0·0420	0·0340
Between operators	1	0·9464***	0·5043***
Interaction, samples and days	6	0·0437	0·0269
Interaction, samples and operators	2	0·0465	0·0520*
Interaction, days and operators	3	0·1354	0·0562*
Error	30	0·05775	0·01380
Total	47	54·49025	89·81990

[1] Where *** ≡ $P<0·001$, * ≡ $P<0·05$; between errors $F_{(10,30)} = 4·18$ $P<0·001$.

of cell concentration. The cells were concentrated by centrifugation and resuspended in a lesser volume of fluid to a hæmocytometer count of 10,000,000 per cubic millimetre. This suspension was designated 100% concentrated blood, and from it the following dilutions, given in percentages, were made: 90, 75, 60, 45, 30, 15 and 10. These were then counted by machine and hæmocytometer, and the resulting counts are plotted in Figure I.

Discussion.

Hæmocytometer counts are accepted as being both tedious and also inaccurate when only one or a limited number of counts are made (Todd and Sanford, 1946). However, this is the usual method of counting red cells, and provides a suitable basis for comparing the accuracy of the machine. The comparison of error terms in Table II demonstrates that machine counts are much less subject to experimental error than hæmocytometer counts.

For both hæmocytometer and machine counts the greatest portion of the variance is attributable to differences

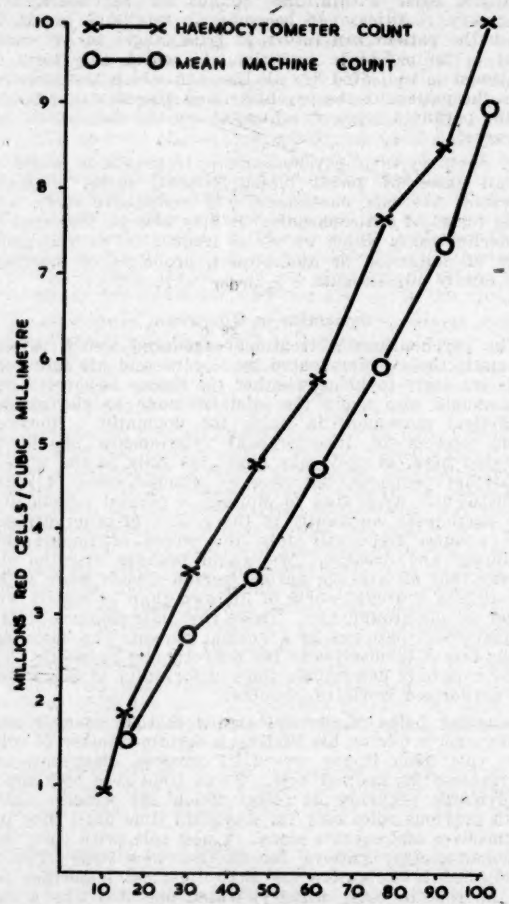

FIGURE I.

between samples. The variance introduced by using more than one operator is highly significant in this analysis, although it comprises only 1·74% and 0·56% of the total variance for the hæmocytometer and machine respectively. In the case of the machine, this small percentage of introduced variance might be considered unimportant; but with comparisons between samples less variable than those here tested, operator differences might well introduce a greater amount of variance and warrant consideration. Counting on different days does not introduce significant variance.

Machine counts with their greater accuracy show up variance differences which are not apparent in hæmocytometer counts—namely, interactions indicating that operators are erratic in the amount of variance introduced in counting different samples and in that introduced in

counts made on different days. These are significant at the 5% level, but for practical purposes may be ignored; in the present analysis they each contribute only 0·06% of the total variance.

The machine gives linear readings over a wide range of cell concentration when cell size falls within the range of compensation (Brackett *et alii*, 1953). From Figure I it will be seen that linear readings are also obtained when the cells fall outside the range of compensation.

Conclusion.

In conclusion, the machine has been found to be (i) simple and fast to operate, (ii) accurate, (iii) not subject to day-to-day variation, (iv) subject to relatively small operator variation, and (v) capable of giving linear reading over a wide range of cell concentration for cells outside the range of compensation for cell size. These attributes make this machine a useful tool for comparative cell counting.

Summary.

1. The Hellige hæmoscope was found to give more accurate results than hæmocytometer counting.

2. No significant variation was introduced by counting on different days.

3. Operator differences were found to be statistically significant, but of a low order (0·56%) of the total variance.

4. For cells outside the range of compensation for cell size, counts were linear over a wide range of cell concentration.

Acknowledgements.

We are indebted to Dr. P. J. Claringbold for the factorial design.

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THE LOESCHKE AND WEVER APPARATUS FOR THE ENUMERATION OF RED BLOOD CELLS.

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IN 1951 Loeschke and Wever described an apparatus for the enumeration of red blood cells by photo-electric measurement.

In discussing current practice they pointed out that the hæmocytometer method has several disabilities—it is very time-consuming and the results are far from precise. They quoted Berkson for a quantitative exposition of these errors. The errors considered by Berkson are the following: (*a*) field error due to random settling of cells in the ruled squares; (*b*) chamber error resulting from the chance variation in the flooding of the hæmocytometer chamber; (*c*) pipette error due to chance variation in measuring with the pipettes. This triad does not include observer error—that is, mistakes made in counting the red blood cells. However, observer error was eliminated in Berkson's experiments by photographing the fields. The errors that arise from the incorrect graduation of pipettes and incorrect rulings or depth of hæmocytometer chambers may be of considerable degree, but they can be controlled by having such apparatus checked by a standards laboratory. Berkson gives the mathematical relationship between the over-all error and its component parts. This is quantitatively stated in the subjoined equation:

$$V_t = \sqrt{\frac{(0{\cdot}92\times 100)^2}{n_b} + \frac{4{\cdot}6^2}{n_c} + \frac{4{\cdot}7^2}{n_p}}$$

where V_t = over-all coefficient of variation,
n_b = number of red cells counted,
n_c = number of independent chambers filled with diluted blood,
n_p = number of independent dilutions made in diluting pipettes;

so that $\frac{(0{\cdot}92 \times 100)^2}{n_b}$ = square of coefficient of variation of red cells counted (empirically corrected).

$\frac{4{\cdot}6^2}{n_c}$ = square of coefficient of variation of chamber error (empirically determined).

$\frac{4{\cdot}7^2}{n_p}$ = square of coefficient of variation of pipette error (empirically determined).

It should be noted that the coefficient of variation is the standard error expressed as a percentage of the observed value.

As ordinarily about 500 cells are counted in one chamber filled with one dilution, the over-all coefficient of variation amounts to 7·8%. This value applies to counts of 5×10^6 per cubic millimetre. For lower counts the coefficient is still greater.

In reviewing attempts to obviate the slow and rather inaccurate counting chamber method, Loeschke and Wever mentioned the turbidimetric method proposed by Blum. This method measures the diminution in the intensity of a beam of light traversing a suspension of red blood cells. This diminution in intensity is due to the scattering of the light by both refraction and diffraction and is therefore dependent on cell size as well as on cell numbers.

The method proposed by Loeschke and Wever consists in essence of the direct measurement of the scattered light. Recognizing that scattering depends not only on the numbers of cells, but also on their size—and this varies greatly under pathological conditions—Loeschke and Wever considered that the essential problem in the method was to allow for the varying effect of cell size on the intensity of the deviated light. They stated their contention as follows:[1]

> *Mit einer Änderung der Teilchengrösse wird nicht nur die Gesamtintensität des gebeugten Lichtes, sondern auch die Richtungsverteilung dieses Lichtes, d. h. die Winkel, unter denen die einzelnen Maxima und Minima auftreten, geändert. Diese beiden Einflüsse lassen sich so gegeneinander ausspielen, diss für einen beträchtlichen Bereich variierender Teilchengrössen diese völlig ohne Einfluss auf die Messung bleiben.*

Loeschke and Wever developed a mathematical argument from which emerged the conclusion that if light of a wavelength of 590 millimicrons is employed, and if only that scattered light is measured which falls on a certain annular area, then, within a range of 5μ to 9μ, cell diameter *per se* has no effect on the amount of light so measured, and therefore the readings are proportional to the cell count alone. This annular area is such that the radii of internal and external perimeters subtend angles of 4° and 16° respectively to a point on the optical axis within the cuvette holding the cell suspension. The red cells are held in dilute suspension in Hayem's solution. The authors point out that these computations are based on the assumption that the red cells are spherical, while in actual matter of fact they are disk-shaped. It may be noted that the thickness of normal red cells is about 2μ, which is outside

[1] "With variation in cell size, not only does the sum total of intensity of deviated light change, but also the directional partitioning of this light, that is, the angles at which particular maxima and minima occur. These two influences may be played off against each other so that for a considerable range of particle size they are completely without influence on the measurement."

the range allowed for in an apparatus constructed as specified above. Loeschke and Wever designed an experiment to examine this point, in which the red cells were allowed to form a sediment on the side of a cuvette. Measurements made with suspended cells in random orientation registered a light intensity only 85% of that of the same number of cells orientated by settling onto the side of the cuvette. Loeschke and Wever stated that the standard deviation of the instrumental measurement amounted to 0·3% of the measured value. It was stated that leucocytes could be counted with the same apparatus, but with considerably less accuracy than the red cells, on account of the greater variation in size.

Matthes and Scharpf examined an apparatus manufactured by Fritz Hellige and Company to the design of Loeschke and Wever. This instrument also incorporated a simple adapting mechanism, which allowed it to be used as an ordinary two-cell hæmoglobinometer. Matthes and Scharpf concluded that this apparatus gave exact values even in pathologically changed blood within the following errors: ± 1% for erythrocytes, ± 3% for leucocytes and ± 2% for hæmoglobin estimations.

We were pleased to have at our disposal one of these instruments (a hæmoscope) in January, 1954, and should like to set out the results of our examination of its performance in the matter of enumeration of red blood cells. Its performance in the enumeration of white cells has not yet been studied nor has any particular attention been given to its function as a hæmoglobinometer.

The optical structure of the instrument is represented diagrammatically in Figure 1. It consists of the following:

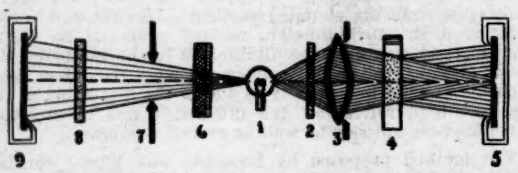

FIGURE I.

1, light source; 2, filter; 3, collecting lens; 4, cuvette; 5, ring-shaped photo-element; 6, filter; 7, measuring diaphragm; 8, ground glass disk; 9, compensating photo-element.

(i) a light source, (ii) a filter to limit the light to the appropriate spectral band, (iii) a collecting lens with a diaphragm, (iv) a cuvette to hold the blood suspension, (v) a ring-shaped photo-element, (vi) a filter with a ground-glass disk for the balancing photo-element, (vii) a measuring diaphragm, (viii) a ground-glass disk, (ix) a balancing photo-element. When the cuvette (iv) is filled with homogeneous liquid the light is brought to a focus in the inactive centre of the photo-element (v) and no electrical potential is induced. When the cuvette (iv) contains a turbid fluid—for example, a suspension of red blood cells—the light is scattered so that some light falls on the active portion of the photo-cell, thereby inducing an electrical potential. The two photo-cells are connected in opposition across a null point galvanometer. When a suspension of red cells is introduced in the cuvette (iv) for measurement, the photo-cells are balanced by movement of the measuring diaphragm (vii), which allows varying amounts of light to fall on the balancing photo-element. This diaphragm is linked to a graduated disk. The light source must be switched on for about one hour before use in order to allow the instrument to attain stability when it is standardized by means of the standards supplied by the makers. There are two standards for red cells, an upper and a lower, and one for hæmoglobin. A simple lever adjustment alters the optical path to allow the instrument to function as an ordinary two-cell hæmoglobinometer.

The dial is graduated in degrees and in two other scales. One of these gives red cells in millions per cubic millimetre and the other gives hæmoglobin in grammes *per centum*. Table I gives the approximate equivalent of these scales in angular degrees. It can be seen that for counts above 6,000,000 per cubic millimetre the scale becomes rather crowded and the readings are unsatisfactory in this region. Similarly, for high hæmoglobin values the readings are crowded and become difficult over 16 grammes *per centum*. With these limitations the results are exactly and quickly read, and parallax is not a difficulty.

The light source of the instrument is powered from the main supply through a transformer which is readily adapted for commonly supplied voltages.

TABLE I.
Graduation Scales.

Red Blood Cells per Cubic Millimetre.	Angular Scale.	Hæmoglobin Value. (Grammes *per Centum*.)	Angular Scale.
1×10^6	85°	20	180°
2×10^6	141°	18	188°
3×10^6	188°	16	200°
4×10^6	228°	14	218°
5×10^6	262°	12	228°
6×10^6	289°	10	246°
7×10^6	311°	8	265°
8×10^6	327°	6	289°
9×10^6	340°	4	313°
		2	350°

For the enumeration of red blood cells blood is diluted 1 in 2000 in Hayem's solution. A capillary pipette is used to measure 12·5 cubic millimetres of blood, and a bulb pipette to measure 25 cubic centimetres of diluting fluid.

It may be mentioned at this point that variations in the concentration of salts in the Hayem solution were found to lead to variations in the readings obtained. Presumably this effect results from osmotic swelling or shrinkage of the cells. It has already been noted that the thickness of the cells (2μ) is outside the size range compensated for by the design of the instrument. Thus it is essential that the Hayem's solution be accurately prepared.

In comparing the hæmocytometer with the hæmoscope for sources of error one sees that the observer error is present in each, although not necessarily to the same degree. The field error of the hæmocytometer is of a statistical nature and is virtually non-existent in the hæmoscope, as approximately 2×10^8 cells influence the light as against the 500 counted in the hæmocytometer count of 5×10^6 red cells per cubic millimetre. (The volume of suspending fluid actually illuminated in the cuvette of the hæmoscope is about $(\pi \times 0{\cdot}75^2 \times 0{\cdot}5)$ cubic centimetres, which would contain about 2×10^8 red blood cells.) There is no error comparable with the chamber error in the use of the hæmoscope, but there are pipetting errors in both methods. Owing to the fact that different volumes of blood and diluent are used, these errors are not necessarily equal. A cuvette that is not clean could influence the measurements, but this source of trouble is easily avoided with care. The importance of accurately making up Hayem's solution has already been mentioned. A discussion of the effect of varying red cell characteristics is deferred until after a discussion of results obtained with normal red cells.

The following matters were investigated by the use of suspensions of red blood cells of normal morphology: (i) instrumental errors in various parts of the scale, (ii) relationship of scale graduation to degree of dilution of a given suspension, (iii) error incorporating both instrumental and pipette errors from which the pipette error itself can be computed, (iv) change in optical properties of suspension with lapse of time, (v) accuracy of standards supplied by makers.

With the use of normal red cells the instrumental error was checked by repeated observations on five arbitrary suspensions chosen to give readings at various points on the erythrocyte scale. These results are stated in Table II and the standard errors calculated from same are given. In this experiment the ten readings on each suspension were carried out about twenty minutes after the sus-

pensions were prepared. It can be seen that the standard error varies from 0·27 to 1·03% of the measured value. At the 5×10^6 region this is comparable with Loeschke and Wever's figure, 0·3%.

Table III shows the hæmoscope readings corresponding to various dilutions of three arbitrary suspensions of red blood cells. From these data it can be seen that there is

TABLE II.

Instrumental Error: Readings on Arbitrary Suspensions of Red Blood Cells.

Reading.	Suspension 1.	Suspension 2.	Suspension 3.	Suspension 4.	Suspension 5.
1	5·36	4·06	3·00	2·20	1·52
2	5·35	4·04	2·97	2·17	1·52
3	5·36	4·04	2·97	2·16	1·54
4	5·32	4·01	2·98	2·18	1·51
5	5·32	4·01	2·96	2·17	1·49
6	5·34	4·04	3·00	2·16	1·52
7	5·34	4·04	2·96	2·17	1·54
8	5·32	4·04	2·96	2·17	1·54
9	5·34	4·02	3·01	2·18	1·51
10	5·34	4·02	2·94	2·16	1·52
Mean ..	5·339	4·032	2·975	2·172	1·521
Standard error	0·0144	0·0132	0·0220	0·0117	0·0157
Coefficient of variation ..	0·27%	0·33%	0·74%	0·54%	1·03%

excellent agreement between the expected and observed readings, so that the calibration of the instrument is proportional to the density of suspended red blood cells. In this experiment, as in the previous one, the readings on each dilution were carried out as speedily as convenient about twenty minutes after preparation.

TABLE III.

Erythrocyte Count Readings on Known Dilutions of Arbitrary Suspensions.

Sample.	Readings.				Mean.	Dilution Factor.	Expected Reading.	Mean / Expected Reading.
Sample A	8·23	8·16	8·20	8·18	8·19	1·2	7·91	1·03
	7·23	7·21	7·27	7·29	7·25	1·3	7·31	0·99
	6·20	6·21	3·21	6·20	6·20	1·5	6·34	0·97
	4·67	4·64	4·64	4·65	4·65	2·0	4·75	0·98
	3·76	3·75	3·76	3·76	3·76	2·5	3·80	0·99
	3·18	3·16	3·18	3·17	3·17	3·0	3·15	1·01
	1·96	1·97	1·96	1·96	1·96	5·0	1·90	1·03
Sample B	8·30	8·30	8·26	8·29	8·29	1·2	8·41	0·98
	7·66	7·70	7·70	7·69	7·69	1·3	7·75	0·99
	6·57	6·54	6·55	6·54	6·35	1·5	6·72	0·98
	5·05	5·06	5·05	5·06	5·05	2·0	5·05	1·00
	4·04	4·03	4·03	4·04	4·03	2·5	4·04	1·00
	3·30	3·29	3·29	3·30	3·29	3·0	3·36	0·98
	2·14	2·14	2·13	2·14	2·14	5·0	2·05	1·04
	1·01	1·01	1·00	1·00	1·00	10·0	1·01	0·99
Sample C	7·78	7·74	7·79	7·78	7·77	1·1	7·64	1·02
	6·86	6·90	6·90	6·91	6·89	1·2	7·01	0·98
	6·45	6·45	6·47	6·49	6·46	1·3	6·49	1·00
	5·65	5·65	5·65	5·66	5·65	1·5	5·53	1·02
	4·20	4·21	4·21	4·22	4·21	2·0	4·22	1·00
	3·33	3·32	3·33	3·34	3·33	2·5	3·37	0·99
	2·86	2·84	2·83	2·84	2·84	3·0	2·85	1·00
	1·66	1·65	1·66	1·65	1·65	5·0	1·69	0·98

A more elaborate experiment was designed to determine the over-all error of the method, and at the same time to study the change in the optical properties of the red cell suspension with lapse of time. Ten dilutions of the same blood were made by the use of the same capillary and bulb pipettes, and the values of these dilutions were read on four occasions at five, ten, twenty and sixty minute intervals after preparation. On each occasion four readings were made (see Table IV).

The means of each of these groups of four instrumental readings are shown in Table V, together with the means of these means and the observed standard deviations of same (σ_{4ip}) for the different time intervals at which observations were made. Since the standard deviation of a single instrumental measurement as already determined is $\sigma_i = 0{\cdot}0132$, it follows that the standard error of a mean of four such readings (σ_{4i}) is $\frac{\sigma_i}{\sqrt{4}}$; that is, 0·0066. By the use of these values and the relationship shown in the subjoined equation, the standard error (and coefficient of variation) of the pipetting was computed and the results are tabulated in Table VI:

$$\sigma^2_{4ip} = \sigma^2_{4i} + \sigma^2_p$$

where σ_{4ip} = over-all standard error observed in experiment,

σ_{4i} = standard error of mean of four instrumental readings.

σ_p = standard error of pipetting.

By the use of a similar mathematical relationship the over-all standard error (σ_{ip}) of the hæmoscope method (one reading) was calculated for the parts of the erythrocyte scale used in Table II. These figures are listed in Table VII, together with the over-all standard errors from comparable hæmocytometer results as deduced from Berkson's data. These figures can also be compared with the Matthes and Scharpf over-all coefficient of variation—namely, 1%.

It can be seen that no important difference is observed in readings due to lapse of time within the period studied (Table V).

As a check on the red cell standards supplied by the makers, a set of four readings was made with the hæmoscope on one dilution from each of ten specimens of normal blood. Similarly, four hæmocytometer counts were performed on different dilutions of the same specimens of blood. In making these dilutions the same pipettes were used throughout. These results are given in Table VIII. The values obtained by the counting chamber method were corrected by factors given by the National Standards Laboratory after their examination of the pipette and counting chamber used. Similarly, the capillary blood pipette used for making the hæmoscope dilutions was examined by the National Standards Laboratory, but the bulb pipette was rejected from examination on account of its structure. As we had already used this pipette in many of the measurements, we checked it ourselves as carefully as possible for performance under the actual conditions of use. The corrected values are given in Table IX together with the correction factors for the hæmoscope calculated therefrom. The standards supplied by the makers can be seen to give values 5% lower than we believe to be correct. This difference may be due to the use of red cells of differing morphology. Such effects are examined below.

While the foregoing investigations were in progress, an article by Frederick Brackett *et alii* became available to us. They described their examination of the hæmoscope and reported that in abnormal blood marked deviations from the correct values occurred. This is contrary to the view of Matthes and Scharpf already quoted. Brackett *et alii* concluded that the discrepancy was related to cell size, and based this view on a study of a range of normal animal and human cells varying in diameter from 4·0μ to 8·8μ. However, the discrepancies noted in the case of abnormal blood were irregular. These observations seemed at variance with the mathematical arguments set out by Loeschke and Wever. However, it appeared to us that this contradiction might have arisen, at least in part, from the fact that the matter of diffraction dominated the mathematical argument, and that it had been assumed that red cells were of uniform opacity, opacity being a necessary condition for diffraction. It is clear, however, that such opacity would vary with the total hæmoglobin content of the red cells, which would in turn be related to both cell size and corpuscular hæmoglobin concentration. Further, it seems that light scattering would be brought about by lens-like refraction of the corpuscles as well as by their diffracting influence. Reference has already been made to one other assumption on which the mathematical reasoning was based—namely, that the red cells are spherical.

TABLE IV.

Overall Error, Including Instrumental and Pipette Error.

Time Interval.	Dilution 1.	Dilution 2.	Dilution 3.	Dilution 4.	Dilution 5.	Dilution 6.	Dilution 7.	Dilution 8.	Dilution 9.	Dilution 10.
5 minutes ..	4·19	4·17	4·19	4·14	4·25	4·18	4·14	4·14	4·18	4·11
	4·17	4·15	4·20	4·15	4·23	4·16	4·12	4·13	4·15	4·08
	4·16	4·14	4·18	4·13	4·19	4·15	4·11	4·12	4·14	4·08
	4·16	4·14	4·18	4·12	4·20	4·16	4·12	4·12	4·14	4·09
10 minutes ..	4·18	4·17	4·20	4·16	4·18	4·19	4·15	4·12	4·13	4·07
	4·18	4·17	4·19	4·15	4·18	4·17	4·15	4·10	4·11	4·09
	4·17	4·17	4·17	4·14	4·20	4·18	4·15	4·10	4·11	4·10
	4·18	4·16	4·17	4·15	4·20	4·19	4·15	4·08	4·11	4·07
20 minutes ..	4·18	4·18	4·21	4·12	4·22	4·21	4·19	4·16	4·19	4·08
	4·18	4·17	4·20	4·14	4·22	4·20	4·18	4·15	4·19	4·07
	4·18	4·17	4·20	4·15	4·23	4·20	4·16	4·14	4·17	4·07
	4·18	4·16	4·21	4·15	4·21	4·19	4·19	4·14	4·16	4·07
1 hour ..	4·20	4·19	4·21	4·16	4·24	4·19	4·19	4·19	4·19	4·12
	4·19	4·19	4·20	4·16	4·24	4·19	4·15	4·19	4·18	4·09
	4·17	4·19	4·20	4·16	4·24	4·19	4·16	4·19	4·19	4·08
	4·18	4·17	4·20	4·15	4·21	4·17	4·15	4·16	4·16	4·09

A group of specimens of abnormal blood was collected for study by selecting from the routine blood counts passing through this laboratory all those in which the hæmoglobin value was less than 10 grammes *per centum*. A few other specimens were included from patients who had been anæmic but who were under treatment. These specimens were examined both with the hæmoscope and with the counting chamber method. In this investigation one reading on one dilution was made in each instance. Table X sets out the various examinations made on these specimens and the numerical results obtained. From these data three scatter diagrams, Figures II, III and IV, were constructed for the purpose of studying the aberration from the correct result relative to various cell characteristics—namely: (i) cell size as measured by volume; (ii) cell size as measured by diameter (major axis); (iii) cell opacity as measured by corpuscular hæmoglobin content. In each of these three diagrams the units along the vertical axis represent the ratio of the counting chamber result to the hæmoscope result. This is, of course, the correction factor for converting the observed hæmoscope reading to the true hæmocytometer reading. Each "correction factor" incorporates the errors of the methods used to obtain it. The values represented along the horizontal axes on each of the three diagrams are respectively as follows: (*a*) The cell volume as computed from the hæmatocrit and the total cell count given by the hæmoscope, column G in Table X. (This method of computing the cell volume was selected because it was hoped that it would be a reasonable approximation to the truth, and also because it would be the height of absurdity to use a hæmocytometer count to obtain a cell volume to correct the result of a hæmoscope observation.) (*b*) Cell diameter as measured in an Eve's halometer. (*c*) Cell opacity as represented by the corpuscular hæmoglobin computed from the hæmoglobin estimation and the reading on the hæmoscope, column H in Table X. Again it was hoped that this would be a reasonably close approximation to the true corpuscular hæmoglobin for the purpose of correction.

Figure II shows the first of these scatter diagrams. The points seem to be quite at random without any discernible trend. This suggests there is little relationship between cell volume and hæmoscope error.

In Figure III the points are somewhat scattered, but there is a definite suggestion of a linear trend in the relationship between cell diameter and correction factor. This observation is in conformity with Brackett's observation. However, it is clear that cell diameter may be loosely related to other characteristics having a considerable influence—namely, the thickness of the red cells and the total hæmoglobin content of the red cells. It should be realized also that some of the scatter could well be due to the large error of the hæmocytometer method.

In Figure IV a linear trend is also suggested between corpuscular hæmoglobin and the correction factor. This diagram was selected for a more detailed study, because in it there seemed to be less scatter than in Figure III, and because it holds up to scrutiny the question of effect of opacity of the red cells on the readings observed by the hæmoscope. A straight line was fitted by inspection, the line passing through the mean of both sets of observation. With the use of this line to obtain correction factors based on corpuscular hæmoglobin, Table XI was constructed to show the ratio of the chamber count relative to the hæmoscope counts so "corrected". The standard deviation of these ratios calculated from the figures is $\sigma = 0{\cdot}249$. If it is allowed that the coefficient of variation of the hæmocytometer counts is 11% (expected value for counts of 1×10^6, which is an extravagant estimate for the group of figures under review), and that the coefficient of variation of the hæmoscope estimates is 1%, then the coefficient of variation of the ratio is 11% as calculated from the following equation, which gives the standard error of a quotient in terms of the standard error of dividend and divisor:

$$\sigma_{b/l} = \frac{\frac{(B\sigma_l)^2}{L} + \sigma_b^2}{L}$$

where $\sigma_{b/l}$ = standard deviation of quotient B/L,

σ_l = standard deviation of L,

σ_b = standard deviation of B.

TABLE V.

Data Relating to Standard Error of Pipetting and Optical Stability of Suspensions.

Time Interval. (Minutes.)	Means of Groups of Four Instrumental Readings.										Mean of Means.	Standard Deviation of Means.
	Dilution 1.	Dilution 2.	Dilution 3.	Dilution 4.	Dilution 5.	Dilution 6.	Dilution 7.	Dilution 8.	Dilution 9.	Dilution 10.		
5	4·1700	4·1500	4·1875	4·1350	4·2175	4·1625	4·1225	4·1275	4·1275	4·0900	4·15150	0·0340
10	4·1775	4·1675	4·1825	4·1500	4·1900	4·1825	4·1500	4·1000	4·1150	4·0825	4·14475	0·0327
20	4·1800	4·1700	4·2050	4·1400	4·2200	4·2000	4·1800	4·1475	4·1775	4·0725	4·17925	0·0415
60	4·1850	4·1850	4·2025	4·1575	4·2325	4·1850	4·1625	4·1825	4·1800	4·0950	4·17675	0·0386

As the calculated figure is far below the empirical value, 25%, it can only be concluded that the corpuscular hæmoglobin content does not offer an adequate means of correction.

TABLE VI.

Estimates of Standard Error and Coefficient of Variation of Pipetting.

Period.	Standard Error Pipetting. (σp)	Coefficient of Variation of Pipetting. (Vp)
Estimate from 5 minutes period ..	0·0334	0·80%
Estimate from 10 minutes period ..	0·0320	0·77%
Estimate from 20 minutes period ..	0·0413	0·99%
Estimate from 60 minutes period ..	0·0329	0·79%
Mean	—	0·84%

TABLE VII.

Erythrocyte Count per Cubic Millimetre.	Estimated Coefficient of Variation (V_t) Hæmoscope.	Coefficient of Variation of Hæmocytometer Method.
$5·3 \times 10^6$	0·84%	7·7%
$4·0 \times 10^6$	0·85%	8·0%
$2·9 \times 10^6$	1·09%	8·5%
$2·1 \times 10^6$	0·96%	9·1%
$1·5 \times 10^6$	1·31%	9·9%

TABLE VIII.

Standardization.

Sample.	Hæmoscope Readings.				Mean.	Chamber Counts.				Mean.
1	5·20	5·17	5·16	5·16	5·17	534	547	548	549	544
2	4·26	4·27	4·27	4·26	4·26	448	467	443	449	451
3	5·16	5·15	5·13	5·16	5·15	495	512	523	510	512
4	4·51	4·50	4·51	4·50	4·50	430	465	467	451	453
5	4·64	4·64	4·64	4·62	4·63	465	460	473	475	468
6	4·60	4·59	4·58	4·58	4·58	454	464	479	478	468
7	4·58	4·56	4·56	4·57	4·57	474	457	452	459	460
8	4·63	4·60	4·59	4·59	4·60	461	469	490	459	469
9	4·77	4·76	4·75	4·75	4·75	488	487	503	475	488
10	4·60	4·65	4·59	4·59	4·60	495	484	485	469	483

TABLE IX.

Corrected Hæmocytometer Means (Factor 1·026).	Corrected Hæmoscope Means (Factor 1·001).	Hæmoscope Correction Factor.
557	5·17	1·08
462	4·26	1·08
525	5·15	1·02
464	4·50	1·03
479	4·63	1·03
479	4·58	1·04
471	4·57	1·03
480	4·60	1·04
500	4·75	1·05
495	4·60	1·08
Mean	.. ..	1·043

It thus seems that in using Hayem's solution to suspend the red cells, such methods do not constitute a simple and satisfactory way of correcting the readings obtained with the hæmoscope in the case of abnormal red cells.

Discussion.

From a study of the discrepancies it seems that the sources of error are (*a*) varying opacity of red cells and (*b*) varying thickness which is beyond the limit of the 5μ to 9μ range compensated for by the design of the instrument. From this it may be conjectured that the hæmoscope could be used to obtain accurate results with abnormal as well as normal blood with speed and ease if a suspending medium could be designed: (i) to render the cells spherical with diameters within limits to which instrumental correction applies, and (ii) to render the cells virtually

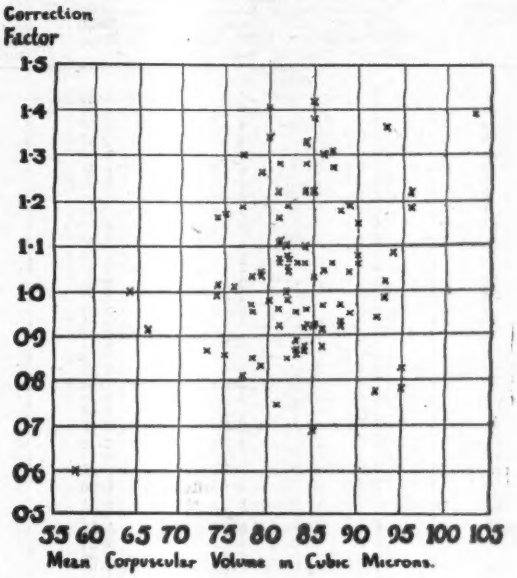

FIGURE II.

Relationship between correction factor and mean corpuscular volume.

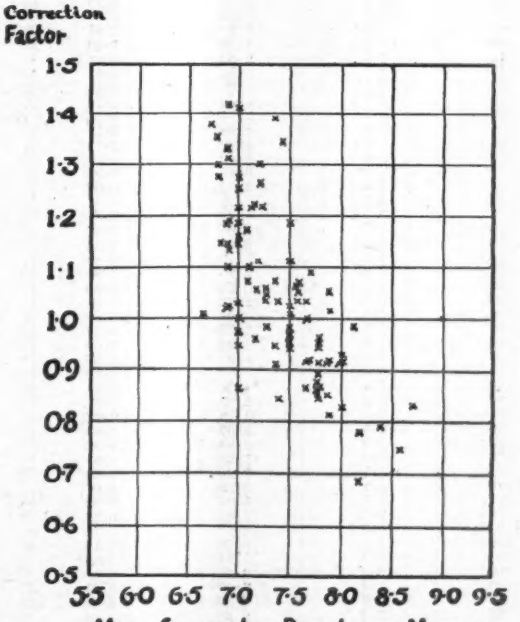

FIGURE III.

Relationship between correction factor and mean corpuscular diameter.

TABLE X.

Tabulated Values Obtained with Specimens of Abnormal Blood.

Specimen Number.	A. Hæmoscope Reading. (Cells per Cubic Millimetre.)	B. Hæmocytometer Results. (Cells per Cubic Millimetre.)	C. Ratio B : A.	D. Halometer Diameter. (Microns.)	E. Hæmoglobin Value. (Grammes *per Centum*.)	F. Hæmatocrit Value of Cells. (*Per Centum*.)	G. Ratio F : A.	H. Ratio E : A.
1	3·6	4·6	1·28	7·0	8·5	29	81	24
2	3·3	3·2	0·97	7·5	9·0	29	88	27
3	3·7	4·1	1·11	7·5	8·7	30	81	23
4	4·0	4·3	1·07	7·6	11·4	33	82	29
5	5·0	5·0	1·00	7·7	9·6	32	64	19
6	3·6	4·8	1·34	7·4	8·3	29	80	23
7	3·9	4·1	1·05	7·3	11·1	32	82	29
8	3·2	3·4	1·06	7·9	8·8	26	81	28
9	3·2	3·1	0·97	7·2	7·8	25	78	24
10	4·3	3·6	0·83	8·7	13·0	41	95	30
11	3·4	4·3	1·26	7·0	8·3	27	79	24
12	1·9	2·2	1·16	6·9	4·1	14	74	22
13	2·7	2·5	0·92	7·7	7·4	23	85	27
14	2·4	2·5	1·04	7·6	6·0	19	79	25
15	3·4	4·8	1·41	7·0	7·8	27	80	23
16	2·6	2·4	0·92	8·0	7·4	21	81	28
17	3·8	4·2	1·10	7·1	9·6	31	82	25
18	3·6	4·2	1·17	7·0	8·3	27	75	23
19	3·1	3·7	1·19	6·9	6·9	24	77	22
20	3·7	3·4	0·92	7·9	10·2	31	84	28
21	2·9	3·0	1·04	7·7	7·8	25	86	27
22	3·8	3·3	0·87	—	10·2	32	84	27
23	2·8	2·40	0·86	7·9	7·8	21	75	28
24	2·7	2·29	0·85	7·4	7·4	21	78	27
25	2·6	3·70	1·42	6·9	6·0	22	85	23
26	2·6	2·02	0·78	8·2	8·8	24	92	34
27	2·9	2·75	0·95	7·4	8·8	24	83	30
28	2·5	2·40	0·96	7·5	6·9	21	84	28
29	3·6	4·0	1·11	7·2	8·8	29	81	24
30	3·5	4·56	1·30	7·2	7·8	30	86	22
31	3·7	4·91	1·33	6·9	8·8	31	84	24
32	3·3	4·01	1·22	7·0	7·8	28	85	24
33	3·0	2·59	0·86	7·8	7·8	25	83	26
34	3·8	3·83	1·01	7·5	8·3	29	76	22
35	3·0	3·81	1·27	7·2	6·5	26	87	22
36	2·7	2·79	1·04	7·4	7·8	24	89	29
37	1·8	1·91	1·06	7·2	5·5	15	83	30
38	3·2	3·53	1·10	6·9	7·8	27	84	24
39	1·8	1·43	0·79	8·4	6·5	17	95	36
40	4·0	3·81	0·95	7·0	9·3	31	78	23
41	4·0	4·11	1·03	6·9	9·3	31	78	23
42	2·3	2·74	1·19	7·5	6·5	22	96	28
43	3·3	3·29	1·00	7·0	6·9	27	82	21
44	3·5	3·28	0·91	7·4	8·8	23	66	25
45	3·5	4·54	1·30	6·8	8·8	27	77	25
46	2·9	2·66	0·91	—	8·3	25	86	29
47	2·7	2·55	0·94	—	8·3	25	92	31
48	3·4	2·9	0·85	7·8	9·7	28	82	29
49	3·7	4·39	1·19	7·0	9·7	33	89	26
50	3·1	2·71	0·87	7·0	8·3	21	68	27
51	2·8	3·34	1·19	6·9	6·0	23	82	21
52	1·6	1·20	0·75	8·6	5·0	13	81	31
53	2·8	3·82	1·36	6·8	7·4	26	93	26
54	3·8	3·49	0·92	7·7	9·7	32	84	26
55	3·4	3·14	0·92	7·8	9·7	29	85	29
56	3·5	3·12	0·89	7·8	9·7	29	83	28
57	3·3	3·23	0·98	7·0	7·8	27	82	24
58	3·7	3·60	0·97	7·8	9·7	32	86	26
59	3·3	3·41	1·03	6·9	7·8	28	85	24
60	2·9	2·40	0·83	8·0	7·4	23	79	26
61	2·6	2·50	0·96	7·8	7·8	21	81	30
62	1·2	0·72	0·60	—	3·2	7·0	58	27
63	2·7	2·73	1·01	6·7	6·0	20	74	22
64	3·5	3·04	0·87	7·8	9·3	29	83	26
65	2·5	2·33	0·93	8·0	6·9	22	88	28
66	3·3	3·60	1·09	7·7	9·7	31	94	29
67	3·9	4·20	1·08	7·1	9·3	32	82	24
68	3·3	3·90	1·18	7·1	8·8	29	88	27
69	3·4	4·70	1·38	6·7	7·4	29	85	22
70	3·2	3·91	1·22	7·1	7·4	27	84	23
71	3·4	3·11	0·92	7·9	7·4	29	85	22
72	3·1	3·97	1·28	6·8	7·4	26	84	24
73	3·3	3·04	0·92	8·0	9·7	29	88	29
74	3·0	3·23	1·08	7·4	7·4	27	90	25
75	3·1	3·29	1·06	7·6	7·8	26	84	25
76	3·1	3·32	1·07	7·6	7·8	25	81	25
77	3·1	3·07	0·99	7·3	7·4	23	74	24
78	3·0	2·6	0·87	7·8	8·3	25	83	28
79	3·2	3·7	1·16	7·0	7·8	29	90	24
80	3·2	3·70	1·16	6·8	6·9	26	81	22
81	3·0	2·94	0·98	7·5	8·3	24	80	28
82	2·9	2·55	0·88	7·8	9·3	25	86	32
83	3·0	2·43	0·81	7·9	8·3	23	77	28
84	3·2	3·39	1·06	7·3	8·8	28	87	27
85	3·2	3·9	1·22	7·2	6·9	26	81	22
86	3·8	3·94	1·04	7·0	9·7	31	82	26
87	3·0	3·44	1·15	6·9	7·4	27	90	25
88	2·8	2·66	0·95	7·8	8·8	25	89	31
89	2·1	1·45	0·69	8·2	6·9	18	85	33
90	2·8	3·43	1·22	7·1	7·8	27	96	28
91	2·9	2·97	1·03	7·5	7·4	23	79	26
92	3·3	4·57	1·39	7·3	9·3	34	103	28
93	3·2	2·82	0·88	7·7	9·3	27	84	29
94	3·1	4·06	1·31	6·9	7·4	27	87	24
95	1·4	1·38	0·99	8·1	3·7	13	93	26
96	2·9	2·95	1·02	7·9	8·8	27	93	30

opaque. The opacity would eliminate refracted light as a component of the scattered light and standardize the diffraction of light from cells of any given size.

As the instrument now stands, Hellige states that incorrect readings may be obtained if the diameter of the cells lies beyond the range of 6·5μ to 8·5μ (halometer reading) and if the corpuscular hæmoglobin concentration (hæmoglobin/hæmatocrit) is beyond the range of 29% to 37%. A case of polycythæmia indicates that even within the permissible range error may occur. In this particular case the relevant data obtained were as follows: hæmocytometer count 6,850,000 per cubic millimetre, hæmoglobin value 23·2 grammes *per centum*, hæmatocrit 62%, halometer 6·5μ, mean corpuscular volume 90 cubic μ (calculated from hæmocytometer count), mean corpuscular hæmoglobin concentration 37%, mean corpuscular thickness 2·7μ. The hæmoscope value was 7,300,000. This again emphasizes the influence of the minor axis—that is to say, the thickness of the cells. In the foregoing data the hæmocytometer figure is the mean of four independent counts and the hæmoscope value is the mean of eight readings.

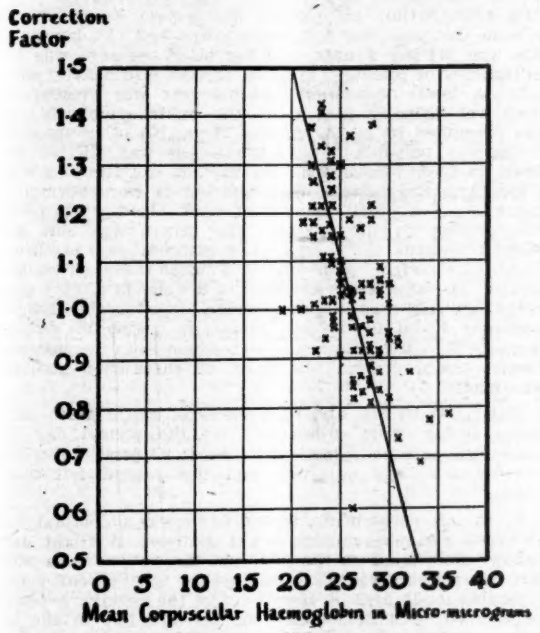

FIGURE IV.

Relationship between correction factor and mean corpuscular hæmoglobin content.

Hellige further states that "Bloods giving a Hæmoscope reading between 3·5 and 5·5 million of erythrocytes may be considered as normal, whilst all pathological bloods which may cause wrong results are giving values not ranging within these limits". As was shown in our dilution experiments, correct results may be obtained beyond these limits provided the red cells exhibit normal characteristics.

In routine work in this laboratory we have adopted the rule-of-thumb method of making hæmocytometer counts instead of hæmoscope estimations if the hæmoglobin value is less than 10 grammes *per centum*. Films are examined in due course and provide additional screening for cell abnormalities. It may be remarked that if cells are normal in appearance the count could in any case be inferred from the hæmoglobin estimation and is hence superfluous. This simple reasoning is apparently not understood by some doctors who refer patients to a laboratory for routine blood examination, and hence is not acceptable to them. Hellige's suggestion of accepting hæmoscope readings as

TABLE XI.

Hæmoscope Readings "Corrected" by Means of Corpuscular Hæmoglobin Concentration.

Specimen Number.	A. Hæmoscope Readings. (Cells per Cubic Millimetre.)	B. Hæmocytometer Results. (Cells per Cubic Millimetre.)	K. Correction Factor from Straight Line of Figure IV.	L. "Corrected" Hæmoscope Reading.	M. Ratio B : L.
1	3·6	4·6	1·19	4·3	1·07
2	3·3	3·2	0·94	3·1	1·03
3	3·7	4·1	1·27	4·7	0·88
4	4·0	4·3	0·78	3·1	1·39
5	5·0	5·0	1·60	8·0	0·63
6	3·6	4·8	1·27	4·6	1·04
7	3·9	4·1	0·78	3·0	1·37
8	3·2	3·4	0·86	2·7	1·24
9	3·2	3·1	1·19	3·8	0·81
10	4·3	3·6	0·70	3·0	1·20
11	3·4	4·3	1·19	4·0	1·08
12	1·9	2·2	1·35	2·6	0·85
13	2·7	2·5	0·94	2·5	1·0
14	2·4	2·5	1·11	2·7	0·93
15	3·4	4·8	1·27	4·3	1·12
16	2·6	2·4	0·86	2·2	1·09
17	3·8	4·2	1·11	4·2	1·0
18	3·6	4·2	1·27	4·6	0·91
19	3·1	3·7	1·35	4·2	0·88
20	3·7	3·4	0·86	3·2	1·06
21	2·9	3·0	0·94	2·7	1·11
22	3·8	3·3	0·94	3·6	0·92
23	2·8	2·40	0·86	2·4	1·0
24	2·7	2·29	0·94	2·5	0·92
25	2·6	3·70	1·27	3·3	1·12
26	2·6	2·02	0·38	1·0	2·0
27	2·9	2·75	0·70	2·0	1·37
28	2·5	2·40	0·86	2·2	1·09
29	3·6	4·0	1·19	4·3	0·93
30	3·5	4·56	1·35	4·7	0·97
31	3·7	4·91	1·19	4·4	1·12
32	3·3	4·01	1·19	3·9	1·03
33	3·0	2·59	1·03	3·1	0·84
34	3·8	3·83	1·35	5·1	0·75
35	3·0	3·81	1·35	4·1	0·93
36	2·7	2·79	0·78	2·1	1·33
37	1·8	1·91	0·70	1·3	1·47
38	3·2	3·53	1·19	3·8	0·93
39	1·8	1·43	0·22	0·4	0·36
40	4·0	3·81	1·27	5·1	0·75
41	4·0	4·11	1·27	5·1	0·81
42	2·3	2·74	0·86	2·0	1·37
43	3·3	3·29	1·44	4·8	0·69
44	3·5	3·28	1·11	3·9	0·84
45	3·5	4·54	1·11	3·9	1·17
46	2·9	2·66	0·78	2·3	1·16
47	2·7	2·55	0·62	1·7	1·50
48	3·4	2·9	0·78	2·7	1·07
49	3·7	4·39	1·03	3·8	1·16
50	3·1	2·71	0·86	2·7	1·0
51	2·8	3·34	1·44	4·0	0·84
52	1·6	1·20	0·62	1·0	1·20
53	2·8	3·82	1·03	2·9	1·32
54	3·8	3·49	1·03	3·9	0·90
55	3·4	3·14	0·78	2·7	1·16
56	3·5	3·12	0·86	3·0	1·04
57	3·3	3·23	1·19	3·9	0·83
58	3·7	3·60	1·03	3·8	0·95
59	3·3	3·41	1·19	3·9	0·88
60	2·9	2·40	1·03	3·0	0·80
61	2·6	2·50	0·70	1·8	1·39
62	1·2	0·73	0·94	1·1	0·66
63	2·7	2·73	1·35	3·6	0·76
64	3·5	3·04	1·03	3·6	0·84
65	2·5	2·33	0·86	2·2	1·06
66	3·3	3·60	0·78	2·6	1·38
67	3·9	4·20	1·19	4·6	0·91
68	3·3	3·90	0·94	3·1	1·26
69	3·4	4·70	1·35	4·6	1·02
70	3·2	3·91	1·27	4·1	0·96
71	3·4	3·11	1·35	4·6	0·68
72	3·1	3·97	1·19	3·7	1·07
73	3·3	3·04	0·78	2·6	1·17
74	3·0	3·23	1·11	3·3	0·98
75	3·1	3·29	1·11	3·4	0·97
76	3·1	3·32	1·11	3·4	0·98
77	3·1	3·07	1·19	3·7	0·83
78	3·0	2·6	0·86	2·6	1·0
79	3·2	3·7	1·19	3·8	0·97
80	3·2	3·70	1·35	4·3	0·86
81	3·0	2·94	0·86	2·6	1·13
82	2·9	2·55	0·54	1·6	1·59
83	3·0	2·43	0·86	2·6	0·94
84	3·2	3·39	0·94	3·0	1·13
85	3·2	3·9	1·35	4·3	0·91
86	3·8	3·94	1·03	3·9	1·01
87	3·0	3·44	1·11	3·3	1·04
88	2·8	2·66	0·62	1·7	1·57
89	2·1	1·45	0·46	1·0	1·45
90	2·8	3·43	0·86	2·4	1·43
91	2·9	2·97	1·03	3·0	0·99
92	3·3	4·57	0·86	2·8	1·63
93	3·2	2·82	0·78	2·5	1·13
94	3·1	4·06	1·19	3·7	1·10
95	1·4	1·38	1·03	1·4	0·99
96	2·9	2·95	0·70	2·0	1·48

correct provided the halometer reading lies between 6·5μ and 8·5μ and the corpuscular hæmoglobin concentration between 29% and 37% substitutes instrumental checks for scrutiny of the stained film as the screening procedure.

Summary.

The Loeschke and Wever apparatus is easy and quick to use and gives precise results. These results are correct if the red blood cells exhibit normal characteristics, such as size, shape and hæmoglobin content. The instrument greatly reduces the labour of counting red cells in routine blood work, but a screening method must be used to select specimens of blood which require to be counted by the hæmocytometer method. In abnormal blood incorrect results are obtained with the hæmoscope, and there seems at present to be no simple method of correction. If a suspending fluid could be devised which would render the cells spherical in shape and virtually opaque, the instrument could be expected to give correct results in abnormal as well as in normal blood, and with the same ease of operation.

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Reports of Cases.

REPORT OF A CASE OF COINCIDENTAL INTRA-UTERINE AND EXTRAUTERINE PREGNANCY.

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Clinical Record.

THE patient, aged twenty-three years, was admitted to the Royal Hobart Hospital on July 30, 1954. Eighteen months previously the patient had undergone laparotomy for correction of a retroversion of the uterus associated with backache. Clinical notes made at this time include the following comments: ". . . subacute pelvic inflammatory disease was found. There was a small right tubo-ovarian mass and dense adhesions surrounding the left tube and ovary. Crossen-Gilliam ventro suspension and appendicectomy were performed. Convalescence from this operation was uneventful." The patient had one child, aged two years and four months. Labour and pregnancy had been normal, but the patient said that she had been ill with a high fever for several days after the confinement. There had been no miscarriages.

On her admission to hospital, the patient said that until two months previously her menstrual periods had been normal in all respects, recurring every twenty-eight days and lasting for five days. Two weeks prior to her admission to hospital she had consulted a doctor and had been told that she was pregnant. Subsequent to the vaginal examination performed at that time she had had bleeding *per vaginam*. This bleeding consisted mainly of a persistent dark "show", considerably less than the usual menstrual flow; but one week before her admission to hospital a flow of bright blood had occurred for about one hour, during which time three pads were soaked. No clots or other material had been passed. Ever since the operation performed eighteen months previously the patient had been subject to frequent attacks of lower abdominal pain, and these had been more frequent and severe in the past two months. During the past twenty-four hours pain in the lower part of the abdomen had been continuous and aching in character, and the patient had been unable to sleep. She had noticed no frequency of micturition or other urinary symptoms. There had been tenderness and fullness of the breasts during the past six weeks. "Morning sickness" had occurred for the past month, and during the past twenty-four hours the patient had felt continually nauseated, but had vomited only once. No shoulder pain had occurred. The bowels had acted normally several hours prior to her admission to hospital. No further symptoms were elicited.

On examination, the patient was a pale young woman in some distress. Her temperature was 99·2° F., her pulse rate was 104 per minute, and her blood pressure was 150 millimetres of mercury, systolic, and 80 millimetres, diastolic. A lower abdominal mid-line scar was present. A mass was palpable just above the pubic symphysis and was presumed to be the *fundus uteri*. No other mass or viscus was palpable. Slight tenderness was elicited low down in both iliac fossæ. On vaginal examination with a speculum the vaginal walls and cervix were normal in appearance. A small amount of dark blood with mucus was present in the vagina. The cervix was soft and pointed towards the coccyx. The external os was closed. Moderately severe pain was felt when the cervix was moved. The uterus was enlarged to the size of a ten weeks' pregnancy and was slightly tender. Considerable tenderness was noted in the left fornix, in which no definite mass could be felt. There was no tenderness in the posterior fornix. A provisional diagnosis of threatened abortion was made.

Strict rest in bed, and phenobarbital, half a grain three times a day, were prescribed. On the second day the abdominal pain had practically ceased; no further bleeding *per vaginam* had occurred, and the patient felt much better.

On the afternoon of the second day lower abdominal pain recurred and was causing slight distress. A slight dark "show" was noted on the pad, and the patient once more felt nauseated. Vaginal examination now revealed considerable tenderness on movement of the cervix. A tender mass about two inches in diameter was felt in the left fornix distinct from the uterus. The slightest increase in pressure on this mass caused extreme pain. A diagnosis of left tubal pregnancy was diagnosed, and it was decided to perform laparotomy immediately.

At laparotomy a small quantity of dark blood, including several small clots, was present in the lower part of the abdomen and in the pouch of Douglas. The ampulla of the left Fallopian tube was grossly distended, but appeared to be intact. The left ovary appeared normal, and a *corpus luteum* was present. A considerable quantity of blood was present in the right tube. The right ovary appeared normal. The uterus was enlarged to the size of a ten weeks' pregnancy, and was well anteverted by the shortened round ligaments. Partial left salpingectomy was performed. The left tube was opened and found to contain an intact gestation sac.

The patient made a satisfactory post-operative recovery and was transferred to a convalescent home on August 12. Her subsequent convalescence was uneventful. An Aschheim-Zondek test performed on August 12 produced a positive result. No bleeding *per vaginam* had occurred, and she was allowed home, with strict instructions to report for follow-up examination at the ante-natal clinic.

The patient presented for examination at the ante-natal clinic on September 28. She felt well. Fœtal movements had been felt for two weeks. The abdominal wound was well healed. The uterus was enlarged to the size of a twenty weeks' pregnancy. Full physical examination revealed no abnormality.

Comments.

This case is considered worthy of recording both for its comparative rarity (1 in 33,000 pregnancies—Nandi) and for its clinical interest. The differential diagnosis of tubal pregnancy from threatened abortion may sometimes be extremely difficult, and this case illustrates clinical features of both conditions.

Acknowledgements.

I am indebted to Dr. J. M. M. Drew, Medical Superintendent of the Royal Hobart Hospital, and to Dr. C. W. Clarke for permission to report this case.

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Reviews.

Textbook of Medicine. By various authors, edited by John Conybeare, K.B.E., M.C., D.M. (Oxon.), F.R.C.P., and W. N. Mann, M.D. (London), F.R.C.P.; Eleventh Edition; 1954. Edinburgh and London: E. and S. Livingstone, Limited. 9½" x 7", pp. 922, with 40 illustrations. Price: 37s. 6d.

THE task of compiling a text-book of modern medicine becomes more and more difficult as the *tempo* of the increase in medical knowledge progressively quickens. Nevertheless the eleventh edition of "Conybeare", now in its twenty-fifth year, accomplishes this task remarkably well and includes within the compass of 900 pages sections on psychological medicine and dermatology and appendices on antibiotics, cortisone and ACTH. With rapid advances in therapeutics it is little wonder that some advice on treatment even in most recent editions of text-books is outmoded by the time they are published; an example in this book is the preference expressed for dihydrostreptomycin in the long-term treatment of pulmonary tuberculosis. Nevertheless, most modern remedies which have proved their worth are given due notice in the text and the appendices help to bridge the gap referred to. It is surprising to find that milliequivalents have not replaced milligrammes *per centum* in biochemical values, and that the old classification of the pneumonias has not yielded to the more logical ætiological one put forward by Scadding. The value of an intercostal tube with a water-seal in effecting the rapid reexpansion of a lung collapsed by a spontaneous pneumothorax deserved to be mentioned, and one would not agree with the generalization that bronchography in children under the age of ten requires a general anæsthetic.

Despite these minor criticisms one must applaud this work and reaffirm that it continues to hold its place as one of the best text-books in medicine for the student and as a basis for post-graduate reading.

Modern Occupational Medicine. Edited by A. J. Fleming, M.Sc., M.D., C. A. D'Alonzo, M.D., F.A.C.P., and J. A. Zapp, Ph.D.; 1954. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson, Limited. 9½" x 6", pp. 414, with 44 illustrations, one in colour. Price: £5 7s. 6d.

INDUSTRIAL MEDICINE in Australia is in an infantile stage of development. Governments and large companies do not all appreciate as yet the value of and need for a full medical service both in saving of insurance premium and as a forger of good relations between employee and management. This book, written by some twenty members of the staff of E. I. du Pont de Nemours and Company, shows how thoroughly industrial medical service can be organized and how valuable its work can be.

The first section of "Modern Occupational Medicine" describes the medical organization, its aim and how these are attained. In most States of America the industrial medical service carries through the treatment of accidents and ailments arising out of employment, so that its facilities must be more elaborate than the first aid arrangements in Australia. However, treatment is only a very minor function of occupational medicine, which is mainly concerned with accurate placement of the individual in his job and then with making the working conditions so safe that no harm can come to him from that job.

Subsequent sections by various members of the scientific medical staff give accurate information about physical and chemical hazards in industry, how to foresee them and how to conduct experiments to assess their danger and the value of protective measures. The variety of hazards met with in the du Pont organization is so large that this book provides ready reference for both general principles and specific details.

Associated services which impinge—medical, legal, sanitation, feeding, safety, psychiatry *et cetera*—are all subjects of special essays, while the final section summarizes the effects and treatment of poisoning by a number of common substances met with in daily life so that the plant physician shall have a ready reference when he receives a frenzied telephone call for help.

This is a most instructive and valuable book for all who are interested in occupational medicine.

The Principles and Practice of Medicine: A Textbook for Students and Doctors. By L. S. P. Davidson, B.A., Cantab., M.D., P.R.C.P., Ed., F.R.C.P., London, M.D., Oslo, and the staff of the Department of Medicine, University of Edinburgh, and associated clinical units; Second Edition; 1954. Edinburgh and London: E. and S. Livingstone, Limited. 8½" x 6", pp. 1048, with 75 illustrations. Price: 32s. 6d.

As its editor points out in his preface to the second edition of this book, the enthusiasm with which the first edition was received has amply justified its publication and the method of its compilation. Within the short period of 18 months the whole of the first edition and a large reprint have been sold. There seems little doubt that its popularity will continue, since the second edition contains several new sections and enlarged versions of others, together with a considerable number of new illustrations, all for the same price as before.

The new sections include a chapter on salt and water balance and acid-base equilibrium and one on the psychoneuroses. There is also a new section on the common infectious diseases which has some excellent coloured plates. The increased number of illustrations is a feature which is particularly noticeable in the section on diseases of the digestive system and by which the section is appreciably improved. An advantage of the production of a second edition so rapidly is in the desirable opportunity it has afforded for bringing up to date the section on chemotherapy. The text throughout has been revised and brought up to date where necessary.

With all these new features there has been no departure from the fundamental role of the work, namely, the provision in book form of a lecture syllabus for medical students on the principles and practice of medicine, and this is emphasized by the nature of the references which have been appended to each chapter. It is obvious that a trustworthy volume of such a character was badly needed, and the new edition will continue very ably to fulfil the need.

The Year Book of Pediatrics (1954-1955 Year Book Series). Edited by Sydney S. Gellis, M.D., and Isaac A. Abt, M.D.; 1954. 8" x 5½", pp. 432, with 112 illustrations. Price: $6.00.

IN the introduction to this Year Book, the editor, Sydney S. Gellis, mentions the following important aspects of pædiatrics in the past year: the extensive work involving the testing of poliomyelitis vaccine in the United States; the description of agammaglobulinæmia and hypergammaglobulinæmia and their relationship to the problems of immunity; the incrimination of oxygen in the ætiology of retrolental fibroplasia; the controversial role of hormonal therapy in the treatment of rheumatic fever; the increasing interest of pædiatricians in the problems of mentally and physically handicapped children and the importance of preventive measures in these fields. In addition to these matters a great deal of interesting material has been included in the Year Book. Individual chapters are devoted to the premature and the newborn, nutrition and metabolism, infectious disease and immunity (with particular attention to poliomyelitis and tuberculosis), allergy, dentistry and otolaryngology, ophthalmology, the respiratory, gastro-intestinal and genito-urinary tracts, the heart and blood vessels, the blood, endocrinology, orthopædics, dermatology, neurology and psychiatry, tumours, therapeutics and toxicology, and miscellaneous subjects. An interesting feature of the editorial comments is the editors' frequent reference of a particular problem to other authorities, whose

comments are quoted. A wide range of journals is covered in this Year Book, which will be of value to all whose field of work touches pædiatrics.

The Year Book of Obstetrics and Gynecology (1954-1955 Year Book Series). Edited by J. P. Greenhill, B.S., M.D., F.A.C.S.; 1954. Chicago: The Year Book Publishers, Incorporated. 8″ x 5¼″, pp. 544, with 83 illustrations. Price: $6.00.

This Year Book continues under the experienced editorship of J. P. Greenhill; so it is not surprising that the editorial comments are an important feature. In them Greenhill not only comments on the abstracts presented, but also adds facts from his own experience and from other current papers. The section on obstetrics has four main subdivisions devoted to pregnancy, labour, the puerperium and the newborn. Pregnancy is dealt with from the point of view of physiology, abortion, ectopic pregnancy, complications and toxæmia. The subdivision on labour opens with some general material, followed by subsections on analgesia and anæsthesia, complications, operative obstetrics and uterine hæmorrhage. The section on gynæcology has subdivisions on general principles, diagnosis, infertility, operative technique, infections, endometriosis, malignant tumours, menstrual disorders and endocrinology. This Year Book, with its customary attractive and convenient format, will be acceptable and useful to obstetricians and gynæcologists and also to many general practitioners.

Cleft Palate and Speech. By Muriel E. Morley, B.Sc., F.C.S.T.; Third Edition; 1954. Edinburgh: E. and S. Livingstone, Limited. 7¾″ x 5″, pp. 194, with 68 illustrations. Price: 17s. 6d.

The third edition of Miss Morley's excellent little book on "Cleft Palate and Speech" follows the general pattern of the previous editions. The new edition also contains a most interesting review of the question of the optimum age for operation with special reference to ultimate speech function and to the effect of operation on subsequent maxillary growth.

The author rightly points out that until, over a long period, two large and comparable series of cases are reviewed, no worthwhile answer can be given on the question of whether between one and two years or alternatively between six and seven years is the optimum age for cleft palate repair: with our present knowledge most surgeons of experience incline to the view that operation at the earlier age is more desirable.

If any criticism can be offered it is that, for a book of this nature, rather too much attention has been lavished on minutiæ of surgical technique, which, after all, can be properly appreciated only in the operating theatre.

The earlier chapters on the normal palate and the history in brief of cleft palate surgery make interesting reading as a lead-up to an account of cleft palate speech and the problems it poses.

By far the most valuable parts of the book, however, are those chapters dealing with speech therapy in all its aspects, a subject which the author has obviously studied at great length and to good purpose. A very important lesson to be learnt from this book is the value that attaches to the closest possible liaison between the surgeon, orthodontist and speech therapist in the adequate treatment of this relatively common deformity.

Miss Morley is to be congratulated on a thoughtful and effective appreciation of the training methods required to restore to these unfortunate little patients a normal speech function with all its attendant blessings.

Antisera, Toxoids, Vaccines and Tuberculins in Prophylaxis and Treatment. By H. J. Parish, M.D., F.R.C.P.E., D.P.H.; Third Edition; 1954. Edinburgh and London: E. and S. Livingstone, Limited. 9″ x 6″, pp. 238, with 33 illustrations. Price: 21s.

The busy practitioner faced with an immunological problem will be glad of the new, third edition of this book. The fact that a new edition is again required after only three years shows the popularity of this short text which explains in simple language the essentials of immunology.

The field is well covered from the practical therapeutic and prophylactic points of view. New chapters have been added on combined immunization with mixtures of bacterial vaccines and toxoid preparations, B.C.G. and virus vaccines.

The appearance of the book has been improved by the change to a larger size and print and illustrations are clearer than in previous editions.

Notes on Books, Current Journals and New Appliances.

Genetica Medica: First International Symposium on Medical Genetics, September 6-7, 1953. Directed by Luigi Gedda; 1954. Rome: Edizioni Dell'Istituto Gregorio Mendel. 8½″ x 6½″, pp. 490, with 177 illustrations. Price: L.5000.

This volume is made up of material presented at the First International Symposium of Medical Genetics, held in Rome on September 6 and 7, 1953. The occasion was the inauguration in Rome of the Istituto Gregorio Mendel, which has been dedicated to medical genetics and gemellology. Contributors to the symposium came from many parts of the world. Thirty contributions relating to many different aspects of medical genetics make up the present volume. Also included are an address by His Holiness Pope Pius XII and several other distinguished visitors. The compiler of the volume, Luigi Gedda, is the Director of the new Istituto Gregorio Mendel. The book is handsomely printed and bound.

The London Medical Handbook; 1954. London: The British and Colonial Druggist, Limited. 10″ x 9″, pp. 136, with three illustrations. Price: 10s. 6d.

This is essentially a list of proprietary preparations, together with the name of the maker or supplier, the composition and the therapeutic indications of each. A "therapeutic index" lists the proprietary drugs said to be of value for various pathological conditions or in various types of therapy; no attempt is made at evaluation of the individual preparations. Introductory articles by eminent contributors on recent advances in medicine, in surgery, in gynæcology and in pharmacology and pharmacy are very brief and only touch the surface. The purpose of this book seems to be simply to supply basic information about proprietary drugs, and in this role it should be useful.

The National Formulary; 1955. London: The British Medical Association and the Pharmaceutical Society of Great Britain. 6¼″ x 4¼″, pp. 210. Price: 5s. (ordinary) and 8s. (interleaved).

This formulary is published in Great Britain jointly by the British Medical Association and the Pharmaceutical Press. It is compiled by a Joint Formulary Committee and is apparently intended as a guide to prescribers, although the point is made that a doctor is free to prescribe what he considers to be in the best interests of his patient whether or not the preparation or its equivalent appears in the National Formulary. The general section of the formulary is arranged in the usual fashion according to types of preparations (applications, capsules, poultices, collodions, nasal washes, mouth washes *et cetera*) and contains a wide range of prescriptions. In addition, there is a pharmacological classification of the preparations included in the general section, in which the drugs and preparations of the formulary are arranged according to their predominant action on one of the bodily systems. A section headed "Notes for Prescribers" contains accounts of the treatment of poisoning and of the various main groups of therapeutic agents (analgesic drugs, antacids, anthelmintics, antibiotics *et cetera*). This volume is convenient in size and compiled for easy reference. It should be helpful in everyday prescribing, although it has been prepared primarily for practitioners in Great Britain.

Midwifery in General Practice.

The issue of *The Practitioner* of July, 1954, is devoted to articles on midwifery in general practice. Six excellent articles by first-class British obstetricians and gynæcologists cover the subjects of painless parturition (Andrew M. Claye), the management of spontaneous and threatened abortion (John Hawkins), failed forceps (William Hunter), the management of breech presentation in pregnancy and labour (R. G. Law), pulmonary tuberculosis and pregnancy (Oswald Lloyd), and the Rh factor in obstetrics (A. S. Duncan). The articles, which are designed for the general practitioner, give a succinct and clear picture of the present status of the problems; avoiding major and often confusing technicalities, they present a wealth of practical recommendations. This number of *The Practitioner* is highly recommended as an addition to the library of all who may come to practise the obstetric art.

The Medical Journal of Australia

SATURDAY, APRIL 9, 1955.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE USE OF CHEMOTHERAPEUTIC DRUGS.

In the issue of February 19, 1955, we published at the request of the Director-General of Health, Commonwealth Department of Health, Canberra, an antibiotic work-sheet. This had been prepared by the Antibiotics Committee of the National Health and Medical Research Council. The work-sheet consisted of a table indicating the suitability of antibiotics in various diseases. It was pointed out that, whenever possible, sensitivity tests should be carried out and that the appropriate antibiotic should be used. It was also stated that while combinations of some antibiotics are often useful as indicated in the work-sheet, penicillin, which is bactericidal, should not be given with the tetracyclines or chloramphenicol, as these antibiotics tend to interfere with the action of penicillin. Stress was also laid on the importance of the development of antibiotic-resistant strains of organisms, especially in hospitals. This table is one which should be kept constantly before the practitioner, who should use it as a practical guide in his work. It has been pointed out over and over again that the present therapeutic trend is very different from that which was known a few decades ago. The present trend is undoubtedly towards empiricism. The patient has a rise in temperature, he feels ill and looks ill; often without further ado or a further investigation the practitioner orders an antibiotic. If the first antibiotic is not successful, another is substituted for it. Not so long ago, a patient became ill with a temperature of 105° F. The practitioner, who could find nothing that was obviously wrong on clinical examination except the rise in temperature, did not take a full clinical history but administered an antibiotic. This was not immediately effective, so another antibiotic was administered and the patient's temperature came down. To the dismay of the patient's relatives, the temperature rose on the third day to the previous height of 105° F. We may cut a long story short by stating that the patient was eventually admitted to hospital, when it was learned that he had spent some time in a malarial country and his blood was examined. Malarial parasites were found in abundance, and when suitable antimalarial treatment was given the patient recovered. It will be said that this was an extreme case and that the practitioner concerned might be excused because of all the work which was crowding in upon him. That may be true, but his was typical of the attitude of many practitioners. Recent graduates are entering practice in what we may call an antibiotic era. Reference may also be made to the indiscriminate use of sulphonamides and antibiotics by surgeons. It will be admitted that in certain circumstances what is known as an antibiotic screen will be justified. Such an example may be quoted in the fact that as a result of the availability of antibiotics, the operation of craniotomy is nowadays unknown in obstetrics, and Cæsarean section may be undertaken in circumstances which would have been regarded as strong contraindications many years ago. But there is a world of difference between the wise and careful use of these powerful agents and their indiscriminate administration. One authority has declared *ex cathedra* that antibiotics are no more a substitute for asepsis than blood transfusion is a substitute for the use of artery forceps. Some may regard this statement as deliberately over-emphatic, but the over-emphasis in the circumstances is justified.

What is described as a review article on the present status of the chemotherapeutic drugs has recently been published by S. R. M. Bushby, of the Wellcome Research Laboratories at Beckenham in England.[1] Some of the conclusions stated in this article may be quoted with advantage in order to emphasize the importance of the antibiotic work-sheet of the National Health and Medical Research Council. Bushby begins by stating that the sulphonamides may eventually be replaced by antibiotics with wider bactericidal activities, but they continue to be popular in general practice because of the ease with which they are administered and their relative freedom from serious side effects. Hypersensitivity is probably their only common disadvantage, especially when they are applied in skin infections. Bushby states that although experimentally the sulphonamides are the least active of the chemotherapeutic agents, they are sometimes more efficient than the antibiotics clinically. It has recently been found that the sulphonamides are superior to penicillin in pneumonia among females, and in the treatment of infantile diarrhœa sulphadiazine has proved to be superior to chlortetracycline or chloramphenicol.

Bushby, discussing penicillin, points out that it is often reputed to be the least toxic of all the antibacterial drugs. He therefore finds it surprising to read that: "Today penicillin heads the list of medicinal agents in the frequency, diversity and severity of the sensitivities which it induces. In current experience it has replaced foreign

[1] *J. Pharm. & Pharmacol.*, October, 1954.

serum as the commonest cause of fatal shock. It is responsible for a growing number of deaths due to irreversible vascular allergy, e.g., *periarteritis nodosa*." He finds that this statement of Kern and Wimberley is well supported by published examples. He quotes one patient who had been given three uneventful courses of penicillin and then a penicillin troche which caused a queer feeling in the chest and a brief fainting spell. Three months later the patient died within seconds of being given an intramuscular injection of penicillin. Clearly, before a patient receives an injection of penicillin, the medical attendant should inquire whether penicillin has been given on a previous occasion and whether any reactions have occurred. If any patient is suspected of having been sensitized to the drug, an intradermal test should be made, the test, as explained by Bushby, being observed especially for a delayed reaction. The patient is not the only person to be considered, because sensitization of workers who prepare and administer chemotherapeutic drugs is a hazard which Bushby insists should be guarded against. In a memorandum issued by the Ministry of Health it was stated that the greatest risk is incurred when workers are dealing with streptomycin; the risk with penicillin is about half as great. Reference is made to the fact that although penicillin has been widely used for seven or eight years, resistant organisms have not become a serious problem except with regard to staphylococci. The incidence of penicillin-resistant staphylococci naturally tends to be high in hospitals where the use of penicillin eliminates the sensitive organisms and where wound infections arise mainly from carriers and cross-infection. Bushby makes reference to an investigation by Phyllis M. Rountree and E. F. Thomson, published in *The Lancet* of August 9, 1952. These workers investigated 915 strains of *Staphylococcus pyogenes* isolated from in-patients during a period of thirteen months. Of the 915 strains, 592 (64·7%) were resistant to penicillin, 253 (27·6%) were resistant to streptomycin, 72 (7·9%) were resistant to "Aureomycin" and "Terramycin", and 11 were resistant to chloramphenicol. In Rountree and Thomson's investigation, the incidence of resistant strains among the staff of the hospital was found to be of ætiological significance, 54% were found to be nasal carriers of staphylococci, and of every ten carriers, eight were carrying penicillin-resistant strains. No less than 47% were carrying penicillin-streptomycin-resistant strains. It is interesting to note that there is experimental evidence that the exposure of an organism to the action of one antibiotic changes its resistance to another; in America, the incidence of penicillin-resistant strains of staphylococci is reported to have fallen during the last two years, and the fall was attributed to the widespread use of bacitracin and the tetracycline antibiotics.

Turning to streptomycin, Bushby points out that it is still the most important drug in the treatment of tuberculosis. It is unfortunate, he adds, that organisms so readily develop resistance to it, because it is also active against many Gram-positive and Gram-negative organisms and when used for short periods it causes few side reactions. In order to reduce the rate at which organisms develop resistance to steptomycin, this antibiotic is now frequently used in combination with other drugs. Combined with sulphadiazine it is usually effective in *Hæmophilus influenzæ* meningitis, and combined with oxytetracyline it is strongly recommended for the treatment of brucellosis.

Chloramphenicol is still unique in being the only antibiotic that is manufactured synthetically more cheaply than it is produced naturally. Bushby points out that large quantities of chloramphenicol were used in America before it was realized that the drug occasionally produces aplasia of one or more elements of the hæmopoietic system. The Council on Pharmacy and Chemistry of the American Medical Association has thought it necessary to advise that the use of chloramphenicol be restricted to the treatment of typhoid fever and other serious infectious diseases caused by organisms resistant to other chemotherapeutic agents.

The tetracycline antibiotics, "Aureomycin" and "Terramycin", are discussed. Bushby states that the terms chlortetracycline and oxytetracycline have now been accepted as the descriptive names for "Aureomycin" and "Terramycin" respectively. It is doubtful whether they will supersede the old names in general use. One fact of practical importance is that the wide antibacterial activity of these two antibiotics causes almost complete sterility of the gut (they are usually taken orally) and therefore interferes with the bacterial synthesis of members of the vitamin *B* complex; deficiency becomes important only after prolonged treatment. More serious than this, however, is the growth of Monilia which can sometimes invade the tissues and produce a fatal infection. This risk is so great that the American Council on Pharmacy and Chemistry issued a warning in 1951, and insisted that on the labelling of this drug attention should be drawn to the risk.

We now come to erythromycin and carbomycin. These antibiotics are derived from two species of Streptomyces and are most active against Gram-positive organisms. They are readily absorbed from the gastro-intestinal tract and have an activity similar to that of penicillin; the main interest in them is that they can be used against strains of staphylococci resistant to penicillin and the tetracycline antibiotics. In regard to erythromycin, a particular warning must be issued. This antibiotic was discussed at the recent meeting of the Federal Council of the British Medical Association in Australia after receipt of a letter from the Director-General of Health. The Director-General pointed out to the Federal Council that organisms would develop resistance to erythromycin, and he recommended that the use of this antibiotic should be limited to the treatment of infections caused by organisms which were resistant to all other antibiotics. The Federal Council adopted this recommendation with the idea that the restricted use of erythromycin would prolong the period of its maximum value and would delay the appearance of strains of organisms resistant to it. As a matter of fact, considerable concern has been expressed about the possible misuse of erythromycin. Even at this early stage of the life of this antibiotic, attempts are made to use it unwisely. Not long ago, one worker in this field who takes a serious view of the possible development of organisms resistant to the antibiotic, had a relative who consulted a medical practitioner for a minor dermatological condition. The practitioner in question telephoned

the doctor-relative and suggested that the infection would be cleared up straight away by the use of erythromycin. One can imagine the joy with which such a statement was received and the ferocity of the expostulation which was sent along the telephone wires. There is no doubt that erythromycin is one of the antibiotics which must be handled with the utmost care and circumspection.

We have to pass over those parts of Bushby's review dealing *inter alia* with the "antitubercular" drugs and the antileprotic drugs and describe some of his observations on combined therapy. Bushby states that the combination of two or more drugs in the treatment of infection is becoming common. He holds that combined therapy can be justified for (*a*) delaying the development of resistant strains, (*b*) increasing the activity by the additive or synergistic effect of two drugs against an organism not sufficiently sensitive to the drugs when acting singly, (*c*) the treatment of mixed infections by drugs with narrow antibacterial spectra, and (*d*) the treatment of infections when the causal organisms are unknown. Precisely how the presence of a second therapeutic drug prevents an organism from developing a resistance to the first is unknown, but it is generally presumed that an organism becomes insensitive by using a metabolic pathway other than that interfered with by the drug. Much attention has been given to the possibility that drugs may interfere with each other. The knowledge that antagonism can occur between two drugs prevents the general use of combined therapy. Bushby quotes authorities to show that it is impossible to lay down rules that a certain combination of drugs will always show synergism or antagonism against a particular species of organism, because strain variations occur. Nevertheless, the authorities put forward a scheme which, it is suggested, should be of clinical value for the selection of combinations of drugs. In this scheme, the drugs are divided into two groups. The first group includes those that are essentially bactericidal—penicillin, streptomycin, bacitracin and neomycin; the second group includes those that are essentially bacteriostatic—the tetracyclines and chloramphenicol. Members of the first group are often synergistic with each other, occasionally indifferent, but never antagonistic. Members of the second group are only additive with each other, and members of this group are usually antagonistic to those of the first group. Unfortunately, combinations of drugs do not show synergism to organisms that are resistant to one of the drugs. Bushby ends his review with reference to one authority who points out that two or more drugs are often given to an acutely ill patient suffering from an infection when a bacteriological or even clinical diagnosis has not been made, but he adds that the genuine necessity for this must be rare. This is the whole point of the discussion. The main objection to treatment of this kind is that if it is commenced before the necessary pathological specimens are taken the diagnosis may be obscured. Nearly as important is the waste of drugs that takes place, and we must not forget the imperceptible, the subtle, deterioration in clinical acumen that must follow. One may feel, as Bushby does, sympathy for the practitioner who is fairly certain of his clinical diagnosis but is in doubt about the sensitivity of the causal organisms to the chemotherapeutic drug, and who uses two or more of these. Occasions will undoubtedly arise when sensitivity tests cannot be made. When this happens, the practitioner should act with his eyes open and with a clear understanding of what he is doing. It is the haphazard use of chemotherapeutic drugs to which objection must and always will be made. We remember that Oscar Wilde wrote: "Most men kill the thing they love." If medical practitioners are not careful, they will create such a field of resistant organisms that antibiotics will cease to be of much value.

Current Comment.

THE HUMAN SOURCE OF TUBERCULOUS INFECTION IN CHILDREN.

One of the most important purposes of measures undertaken to discover cases of tuberculosis, whether in the form of mass surveys or otherwise, is to find sources of infection so that they may be rendered harmless to uninfected people by segregation, by treatment or by education in personal hygiene, or by various combinations of these measures. An important clue to such a source of infection is the occurrence of tuberculosis in children, and it is clear from a recent study by Barbara Briggs, R. S. Illingworth and J. Lorber[1] that the source mostly can be found. In this study a search was made to determine the source of infection of 564 tuberculous children suffering from intrathoracic, miliary or meningeal tuberculosis. The source of infection was determined in 367 cases (65·2%); but what was considered to be an adequate search for contact was made in only 401 cases, and here the proportion of success after adequate search was very high (327 out of 401, or 81·5%). The source of infection was found in 95·9% of children under the age of one year, in 86·1% of those aged one year, in 84·6% of those aged two to four years, and in 64·5% of those aged five to fourteen years. Of the adequately investigated families, the father had tuberculosis in 119 instances, the mother in 108, other relatives in 143 and other persons in 46. It is apparent, as Briggs, Illingworth and Lorber point out, that most of the sources of infection were within the household, for over three-quarters of the contacts were parents or other persons living in the house. It is a striking fact that among the adequately investigated families, the contact was known beforehand in 70% of cases and discovered afterwards in only 11·4%; no contact was found in 18·5% of cases. Amongst the inadequately investigated families, the contact was known beforehand in 22·7% of cases and discovered afterwards in 1·8%; no contact was found in 75·4% of cases.

From their knowledge of the source of infection gained as a result of this study, Briggs, Illingworth and Lorber have brought together some of the more important means at our disposal for preventing tuberculous infection in children, and have arranged these under headings, illustrating most of the headings by one or two stories to show the consequences of lack of attention to detail in the measures indicated. They point out the importance of notifying all cases of childhood tuberculosis, so that an intensive search for the source of infection can be made. This enables the infected adult to be treated and other child contacts to be protected from infection by B.C.G. vaccine or other means. It is also important to examine all child contacts immediately when an adult is found to have tuberculosis, so that tuberculin-negative children can be segregated until they have been protected by B.C.G. The need is stressed for a greater sense of urgency in these preventive measures. Other antituberculosis measures for which greater attention is urged include the following:

[1] *Lancet*, February 5, 1955.

(i) Chest X-ray examination of all adults with symptoms that may be due to tuberculosis. (ii) Chest X-ray examination of all adults who may be a source of infection. (iii) Continued supervision of adults whose tuberculosis is supposed to be inactive, the point being borne in mind that former patients who are "sputum-negative" should be regarded as potentially infectious if they are in contact with children. (iv) Prevention of contact between unprotected children and adults with tuberculosis, including the exclusion of tuberculin-negative children from tuberculosis wards of hospitals and sanatoria at visiting time. (v) Instruction of adult patients in the infectivity of their condition and in elementary hygiene. Mention is also made of the value of B.C.G. vaccination for children who cannot permanently be prevented from coming into contact with infected adults.

Briggs, Illingworth and Lorber state that they have made no attempt to give a comprehensive account of all the various measures which are important in the prevention of tuberculosis in children. They have picked out from their experience certain measures which they think need to be reemphasized, in that tragedies are often seen because these measures have not been applied or because there was delay in their application. The need is stressed for a greater sense of urgency. When a child is notified as having acquired tuberculosis, every possible effort should be made immediately to determine the source of infection, however old the person who is the source may be. That this is worth while is shown by the figures quoted in this study; the source of infection was demonstrated in 81% of children who were adequately investigated, and appropriate measures could then be taken. Attention is drawn to the particular importance of the fact that the source of infection could be found in 95·9% of children under the age of one year, and also to the equal importance of the fact that in the older age group (children aged five to fourteen years) the source could be found in 64·5% of cases. The importance of this latter fact is described as lying in the attitude so often found that, for the older child, the possible sources of infection are so numerous that it is hardly worth while making the effort to look for them. The figures quoted by Briggs, Illingworth and Lorber belie that idea, and they think it extremely likely that with still more vigorous efforts their figures for the frequency with which the source of infection was found could be quite considerably improved. The corollary to this, as has been already mentioned, is the importance, after the finding of an adult contact, of conducting an immediate examination of all child contacts and the taking of appropriate steps to prevent further contact or to protect the child in some other way, as by treatment with B.C.G.

There is a great deal of common sense in the measures suggested in this article, and the data presented line up with the recommendations. If further credentials are required, they may be found in the remarkable fall of childhood tuberculosis mortality in Sheffield between 1947 and 1952 which has been previously reported by Lorber,[1] the point being that he, Professor Illingworth and Dr. Briggs are all working in Sheffield. It is conceded, however, that there is still a great deal of morbidity due to tuberculosis in Sheffield and in the surrounding region, and that much of it can be prevented by further vigorous and determined efforts. This realistic attitude, in conjunction with the results already obtained, should be an encouragement to others to go and do likewise.

ARTIFICIAL RESPIRATION.

In the days of Queen Anne, according to T. O. Garland,[2] the Thames watermen had a saying that the only thing to do for a drowned man was to pick his pockets. Since those days much water has flowed under the Thames bridges, and we have learnt to do a good deal of a more helpful nature for the drowned man, or at least for the apparently drowned man, and for others with suspended respiration. Commonplace features of modern civilization, such as electricity and gas, have also added greatly to the number of occasions on which artificial respiration is required; so Garland's little book on artificial respiration is of much topical interest in that he describes the history of artificial respiration and explains fully, with the help of excellent pictures, the various methods that have been devised, both good and bad, with special attention to the best modern methods. He supports the now generally accepted view that the Holger Nielsen method is the best for most purposes. However, he goes on to point out that in certain circumstances the Holger Nielsen method is not practicable and describes the advantages of Eve's rocking method in certain circumstances, more particularly when the patient has internal injuries or fractured ribs. Special methods are explained for use when victim and rescuer are either sitting in an open boat or at the top of a pole.

The history of the development of methods of artificial respiration is most interesting, and Garland has done a genuine service in recounting it in a readable way. It goes back into antiquity when many ingenious and sometimes surprisingly effective methods were used; but the great landmarks are the introduction of the Sylvester method in 1861, of the Schafer method in 1903, and of Eve's rocking method and the Holger Nielsen method in 1932. Perhaps the most exciting part of the story relates to the experimental evaluation of modern methods. Few people know of the remarkable experiments carried out by Squadron-Leader E. A. Pask and Professor R. R. Macintosh at the University of Oxford in 1943. Pask initiated these experiments and voluntarily allowed himself to be the guinea-pig. He was deeply anæsthetized, his trachea was intubated, and his lungs were over-ventilated with a pair of hand bellows until breathing stopped. Then the Sylvester, Schafer and Eve methods of artificial respiration were applied to him in turn, the tidal air flow being determined in each case. This was a courageous enterprise on Pask's part, but at least he had the satisfaction of gaining a doctorate in medicine from his thesis on the experiments, thereby attaining, as Garland puts it, "the singular distinction of winning an M.D. for work, much of which he had done while asleep". He had the further satisfaction of knowing that his work led the way for the major experiments carried out in the United States in 1950 and 1951, to which we made reference in these columns on May 12, 1951, and May 3, 1952. In these experiments particular atention was paid to the Holger Nielsen method, and its superiority was conclusively shown. There is no question that the Schafer method has, in the past, been effective in restoring or in saving the lives of a great many people, and it is well that it should be still generally understood. However, most people will agree with Garland that all who learn artificial respiration should be taught the Holger Nielsen method as well as the Schafer method until enough people know it to enable the Schafer method to be dropped altogether. Both teachers and pupils will benefit from reading what Garland has to say, particularly as the aim of his book is to explain the principles of artificial respiration rather than to serve as a drill book. As Garland wisely comments, "if the principles are understood properly, something useful can be done in almost any situation".

TREATMENT OF ANGINA PECTORIS.

Nitroglycerin, since its introduction by Murrell in 1879, has been preeminent in the treatment of *angina pectoris*. It is effective in most cases in cutting short an attack within a few minutes; and taken just before contemplated exertion, it usually prevents an attack or greatly lessens its intensity. Unfortunately it is active for only a short time after it is taken. For many years attempts have been

[1] *Brit. M. J.*, November 21, 1953.

[2] "Artificial Respiration: With Special Emphasis on the Holger Nielsen Method", by T. O. Garland, M.A., M.D., D.P.H.; 1955. London: Faber and Faber, Limited. 9" × 5½", pp. 60, with 27 illustrations. Price: 6s. 6d.

made to find a drug which is as active as nitroglycerin but acts for a period of hours. Many substances, some nitrates of organic substances other than glycerol, others not related to the nitrates, have been tried, but few have stood the test of clinical usage. The most obvious, and the most used, tests of activity are the ability to suppress the pain of an anginal attack quickly and the time during which further attacks are prevented or lessened in intensity. It is not possible to measure the intensity of pain; indeed, in any individual the intensity of the pain induced by a given stimulus varies considerably. To a given amount of exercise a patient may react on one occasion with no pain and on another with severe pain, although the electrocardiographic changes are essentially the same in both cases. The exercise tolerance test has been used by J. E. F. Riseman, L. A. Steinberg and G. E. Altman[1] in assessing the value of cinchona alkaloids and related substances in the treatment of *angina pectoris*. The exercise consisted of repeatedly ascending and descending a two-step staircase until a typical attack of angina was induced or the patient had done at least 50% more work than was possible without the drug. H. I. Russek, B. I. Zohman and V. J. Dorset,[2] in a paper entitled "Objective Evaluation of Coronary Vasodilator Drugs", have compared the ability of specific drugs to modify the electrocardiographic response to standard exercise. The patients studied by Russek *et alii* were selected as being those who reacted well to nitroglycerin and gave, on repeated testing under identical conditions, a relatively constant response to a given amount of exercise. The following drugs were studied: nitroglycerin, papaverine hydrochloride, ethyl alcohol (whisky), aminophylline, "Ronicol" (β-pyridyl-carbinol tartrate), "Tolazoline" ("Priscol"), tetraethyl ammonium chloride, octyl nitrite, visammin (khellin), heparin, morphine, bishydroxycoumarin, dioxyline ("Paveril"), triethanolamine trinitrate biphosphate ("Metamine"), "Nitroglyn" and pentaerythritol tetranitrate ("Peritrate"). It is stated that nitroglycerin, in therapeutic doses, exerts a favourable effect on the response to exercise as recorded electrocardiographically. Ethyl alcohol, given five to twenty minutes before exercise, did not in any case elicit a favourable electrocardiographic response, but did prevent or reduce the anginal pain in more than half the patients. Papaverine, in the usually recommended doses, had no favourable effect on the electrocardiographic response, but when given in doses of one to two grains (0·065 to 0·12 gramme) intravenously or three to eight grains (0·194 to 0·518 gramme) orally was effective in some patients. "Metamine", "Paveril" and "Nitroglyn" had little or no effect even in large doses. Of all the drugs studied "Peritrate" (pentaerythritol tetranitrate) was the most effective for prolonged prophylactic effect in *angina pectoris*. A dose of 10 to 20 milligrammes afforded protection for four to five hours. None of the other drugs tried had any impressive effect on the electrocardiographic response to exercise, and, of those tested, only nitroglycerin, papaverine and "Peritrate" appeared worthy of continued clinical use.

It has been known for many years that some patients with *angina pectoris* react well to administration of quinidine, but most physicians hesitate to use it because of its other effects. Riseman *et alii* have studied the efficiency of five cinchona alkaloids (quinidine, quinine, cinchonine, cinchonidine and cinchamidine) and also three antimalarials (chloroquine, pentaquine and chlorguanide) and procaine amide, pentaerythritol tetranitrate and nitroglycerin in the treatment of *angina pectoris*. As well as the standard exercise studies mentioned earlier, electrocardiographic studies were made in a few cases. Four of the cinchona alkaloids (quinidine, quinine, cinchonidine and cinchamidine) proved to be highly effective in some, but not all, patients with *angina pectoris*. It is stated that the patients most likely to respond to these drugs are those who respond well to nitroglycerin. Riseman *et alii* state that "quinine and quinidine are among the most effective of the drugs available for the treatment of *angina pectoris*". These were given in doses of six grains (0·4 gramme) every eight hours. Quinine is regarded as the drug of choice because of the potential cardiotoxic effects of quinidine. The use of quinine (as Peruvian bark) for angina was noted as early as 1795; and in Hope's "Treatise on Diseases of the Heart", published in 1842, it is stated that "Quina is the specific for intermittent angina". One wonders why quinine is now seldom mentioned as a useful drug for the treatment of *angina pectoris*. A very curious result is the finding by Riseman *et alii* that pentaerythritol tetranitrate is not of much use in the treatment of angina. From many papers one gathers the general opinion that it is the best of the long-acting drugs now available for the prevention of anginal attacks. Its combination with one or more of the alkaloids of rauwolfia root has been recommended by several writers. Thus E. W. Snow[1] used "Pentoxylon" (pentaerythritol tetranitrate with "Rauwiloid") and states that the patients showed a great increase in exercise tolerance, although only 13 of 25 patients showed electrocardiographic improvement. None of the drugs recommended has any curative effect on patients suffering from *angina pectoris*, and it is clear that much more investigation is necessary before a drug will be found to relieve all these patients.

[1] *Circulation*, December, 1954.
[2] *Am. J. M. Sc.*, January, 1955.

POST-GRADUATE WORK IN THE UNITED KINGDOM.

WE have received from the Empire Medical Advisory Bureau in London the revised edition of their "Summary of Regulations for Postgraduate Diplomas and of Courses of Instruction in Postgraduate Medicine". In addition to the detailed information about diplomas and courses of instruction, details are provided on hospital appointments in the United Kingdom, opportunities for work in *locum tenens* appointments and the medical registration of overseas doctors. An outline is also given of the facilities provided by the Empire Medical Advisory Bureau, which was established by the Council of the British Medical Association in 1948 with a view to welcoming and providing a personal advisory service to practitioners visiting the United Kingdom from overseas. Communications relating to the work of the Bureau should be sent to Brigadier H. A. Sandiford, Medical Director, Empire Medical Advisory Bureau, B.M.A. House, Tavistock Square, London, W.C.1. Those who wish to consult the publication to which we have just referred are advised that copies of it have been sent to the following: the General Secretary of the Federal Council of the British Medical Association in Australia; the Honorary Secretaries of the Branches of the British Medical Association in New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia; the Deans of the Faculties of Medicine at the universities; the directors of the Post-Graduate Committees in the several States.

HALF-YEARLY INDEX TO "THE MEDICAL JOURNAL OF AUSTRALIA".

THE index to THE MEDICAL JOURNAL OF AUSTRALIA for the half-year ended December 31, 1954, is now in the press and will be available in the near future. A copy of the index is sent to all libraries, medical societies and associations receiving THE MEDICAL JOURNAL OF AUSTRALIA, as well as to journals having exchange arrangements with the journal. Readers who have previously asked to have their names placed on the index mailing list will receive their copies as usual. Other readers who wish to receive a copy are invited to write to the Manager, The Printing House, Seamer Street, Glebe, New South Wales.

[1] *Northwest Med.*, January, 1955.

Abstracts from Medical Literature.

LARYNGOLOGY AND OTOLOGY.

Congenital Laryngeal Stridor.

D. C. Baker (*Arch. Otolaryngol.*, August, 1954) states that most of the causes of noisy breathing can readily be diagnosed by careful examination of the nose, mouth, pharynx and larynx. Direct laryngoscopy alone will not reveal causes of stridor arising in the trachea or bronchi. Bronchoscopy or tracheo-bronchography may be necessary in the study of these sites. A very important cause of stridor is constriction of the trachea or of a large bronchus by a ring type of congenital anomaly of the aorta or its branches. The success of surgical treatment of these anomalies depends upon early diagnosis. The present study includes a review of 83 cases of congenital laryngeal stridor. Respiratory obstruction was severe enough in three cases to necessitate tracheotomy. In five cases stridor was attributed to an enlarged thymus, and X-ray treatment was administered without benefit. Subsequent laryngoscopy revealed the cause of the noisy breathing to be congenital laryngeal stridor. The author has reviewed the case histories of six infants with congenital anomalies of the aorta. Five of the patients had a definite history of stridor along with attacks of cyanosis and dysphagia during feeding. Paroxysmal attacks of dyspnœa were frequently precipitated by disturbing the patient. If not enough is found to account otherwise for the stridor, tracheo-bronchography X-ray films are made, after instillation of the iodized oil through a rubber catheter introduced via the laryngoscope. Constrictions of the trachea and of the œsophagus may be demonstrated. Where vascular abnormalities such as double aorta or vascular ring are suspected, surgical approach to the mediastinum may lead to cure of the constricting abnormality.

The Intranasal Use of Hydrocortisone Alcohol.

L. E. Silcox (*Arch. Otolaryngol.*, October 1954) states that cortisone or corticotropin in the strength required to effect beneficial results not infrequently produces objectionable complications and should be used only for patients who have failed to respond to more conservative therapy. Additional limitations to the use of these hormones arise from the fact that they are not readily soluble in water. Hydrocortisone has proved to be the most promising of the newer steroids. Hydrocortisone alcohol, as distinguished from the acetate, has proved to be the most valuable form of this steroid. Given orally, it is 50% more potent than either cortisone acetate or cortisone alcohol and twice as potent as hydrocortisone acetate. The greater solubility of hydrocortisone alcohol makes it particularly suitable for oto-rhino-laryngological use. Clinical experiments were performed to determine whether the topical administration of hydrocortisone alcohol would be of value in nasal allergy and what might be the lowest effective concentration of the hormone. In addition, the local effects on pharyngeal and nasopharyngeal lymphoid tissue was studied microscopically. The study was conducted for one year on 174 patients who suffered from allergic rhinitis; 57 of these had polypi. All patients' symptoms were either severe or moderately severe. The medicaments were administered by spray bottle, four times daily. A beneficial effect of the steroid on polypoid tissue was frequently marked, occasionally dramatic; however, it was not always permanent. The effect, which appears to be a local one, was often noticeable with quite dilute solutions—two milligrammes per 100 millilitres. The most effective solution was one of 20 milligrammes per 100 millilitres. A combination of this with vasoconstrictors was found to be helpful and seemed to facilitate the action of the steroid. No local irritation was caused. It is concluded that hydrocortisone alcohol solution in combination with vasoconstrictors is a highly effective adjunct medication for the treatment of allergic rhinitis and allergic rhinitis with polypi. It is of little or no value in treating non-allergic rhinitis. Objective improvement in the appearance of the tissues and marked relief of symptoms were noted. It does not cure the condition. No effect was produced upon the growth of lymphoid tissue in the nasopharynx or pharynx as observed either grossly or microscopically. In later studies it appeared that the spray solution was rendered helpful in cases of bacterial inflammation by the addition of antibiotics — neomycin, gramicidin and polymyxin B.

Malignant Tumours of the Nasopharynx.

H. J. Hara (*Arch. Otolaryngol.*, October, 1954) states that during a five-year period 16 primary malignant tumours of the nasopharynx were observed at the Los Angeles County General Hospital. In twelve years 17 such tumours were observed at another hospital. Of 33 patients the youngest was a sixteen-year-old girl, the oldest a seventy-year-old man. There were 25 males and 18 females. A disproportionately high incidence amongst Chinese was demonstrated. In Hong Kong the incidence was 18% of all malignant tumours. In the series of 33 cases squamous cell carcinoma was the commonest (15), next was anaplastic carcinoma (seven), and lymphepithelioma was third (six). The early symptoms are vague throat irritation, altered vocal resonance, intermittent tubal obstruction, post-nasal discharge and occasional epistaxis. Unfortunately the patients usually wait until other signs develop. Thus of this series the initial objective signs were cervical adenopathy in 13, nasal obstruction in 12, visual disturbance and head pain in five and impaired hearing in three. There may be a lapse of six to eleven months between the appearance of these signs and the discovery of the site of the primary growth. This is the responsibility of the medical profession. The growth rapidly invades any of the preformed foramina of the adjacent skull base. Involvement of cranial nerves may then take place. The abducens nerve is the most vulnerable. Next the fifth, third and fourth nerves may be affected, or with involvement of the jugular foramen paralysis of some or all of the lower four cranial nerves and cervical sympathetic may occur. Diagnosis may be made by posterior mirror pharyngoscopy or with the nasopharyngoscope. A small tumour may readily escape detection. Repeated examinations are indicated. Cytological studies, biopsy examination and X-ray examinations may help to confirm the diagnosis. Malignant growths in this area are highly radiosensitive. Irradiation is the treatment of choice for both sarcomatous and epithelial growths. In the present study 30 patients received irradiation only; 21 died of the disease; four survived the five-year period; three others are living after a shorter period. Surgical removal appears to be the better treatment for some types of tumours, notably benign angiofibroma, fibrosarcoma, adenocarcinoma and sometimes a well localized lymphoma. A transpalatine approach has been found to give a complete view of the field of operation without sacrificing vital structures and with excellent post-operative cosmetic effect on the soft palate. A horse-shoe-shaped incision is made down to the bone, beginning one centimetre medial to the last molar tooth on the left, then swept along inside the dental arch forward, just back of the foramina of Scarpa, thence returning in similar position to the right third molar. The palatine foramina and vessels on either side are avoided by this incision. The soft tissues may now be separated backwards off the bony palate as a flap. When the posterior border of the palate bone is reached, a curved dissector is used to elevate the nasal mucosa from the floor of the nose. Portions of the palate bone and vomer may next be nibbled away with a biting rongeur. A soft rubber catheter introduced through the nose and then brought out through the mouth is used to draw the soft palate forward to give an adequate view of the field. The tumour is dissected and then snared. The stump may be cauterized. Perfect hæmostasis is obtainable.

OPHTHALMOLOGY.

Genetic Carrier State.

Harold F. Falls (*Am. J. Ophth.*, June, 1954) discusses genetic carriers as they affect ocular pathology. He deals with genetic carriers under four headings: individuals heterozygous for a pathological trait which is commonly thought of as recessively inherited, but is actually due to an incompletely dominant gene; individuals having the gene for a disease trait which does not appear until adolescence or middle or old age; affected individuals exhibiting only mild or minor effects of a dominant gene which when transmitted to their progeny may exhibit a more serious form; those having a carrier state for a large

number of diseases in which the specific genetic mechanism is unknown. In relation to the first group he discusses choroideræmia, choroido-retinal degeneration, sex-linked albinism, congenital ophthalmoplegia, megalocornea, colour vision anomaly and congenital anhidrotic ectodermal dysplasia, all of which are due to sex-linked intermediate genes. In addition, diseases due to autosomal genes in this first group are *xeroderma pigmentosa*, strabismus, juvenile amaurotic idiocy, albinism, Wilson's disease, keratoconus and Laurence - Moon syndrome. Under the second heading he discusses primary glaucoma, essential hypertension, gout, ankylosing spondylitis and Fuch's epithelial and endothelial dystrophy. In relation to the third group he mentions the phakomatoses, Marfan's syndrome, Waardenburg's syndrome, status Bonnevie-Ullrich, Ehlers-Danlos syndrome, *myotonia dystrophica*, essential familial hypercholesteræmia, *osteogenesis imperfecta* and mandibulo - facial dysostosis. In relation to the final group he discusses *diabetes mellitus* and allergic diseases.

Cataract Formation following β-Ray Radium Therapy.

G. M. HAIK *et alii* (*Am. J. Ophth.*, October, 1954) report four cases in which β irradiation used for recurrent pterygium was followed by cataract formation. The area in which cataract formation appeared corresponded to the area irradiated; the subscapular areas were particularly affected. Since observing these cases the authors have used β irradiation and recommended that it be used immediately after operation and that the dosage should not exceed five minutes. If at the end of six to eight weeks a recurrence is observed, the recurrent tissue is excised and another five-minute application is made.

Temporal Arteritis Syndrome with Ocular Involvement.

F. C. CORDES (*Am. J. Ophth.*, October, 1954) reports two cases of temporal arteritis with involvement of the ophthalmic artery. In both cases the patients lost vision in the affected eye and developed subsequent optic atrophy. The author states that the disease, which is limited to elderly patients, occurs in females in 75% of cases. There is constant headache with malaise, lassitude, weakness, fever, anorexia, loss of weight, anæmia and leucocytosis. The ocular complications may consist of diplopia, muscular paresis, pain in the eyeballs and photophobia, or more severe symptoms such as thrombosis of the central retinal artery or an ischæmic optic neuritis with a swollen or pale papilla. The author states that the name temporal arteritis is a misnomer, as arterial disease is present in all vessels of the body.

Sympathetic Ophthalmia following an Operation for Retinal Detachment.

W. KORNBLUETH AND R. STEIN (*Brit. J. Ophth.*, December, 1953) describe a patient who developed sympathetic ophthalmia following an operation for retinal detachment—the first in the literature. The patient, a child, aged eight and a half years, was a high myope with a complete detachment of the right eye. He was subsequently discharged from hospital with the retina still detached, and five months later enucleation of the eye was advised as the eye was beginning to shrink. Unfortunately this was refused, and he subsequently reported with sympathetic ophthalmia, which in spite of enucleation of the exciting eye and intensive treatment with cortisone led to phthisis of the sympathizing eye. Sympathetic ophthalmia in the exciting eye was confirmed by pathological examination.

The Scope of Corneal Grafting.

B. W. RYCROFT (*Brit. J. Ophth.*, January, 1954) discusses the present-day difficulties associated with corneal grafting under the headings of technique, administration and biological problems. He considers that the difficulties in technique are associated with several factors: the first is fixation of the graft, and he is of the opinion that separate interrupted radial sutures are undesirable; the second is cutting the graft, and in his view it should be handled as little as possible and cut by the punch method; the third is the selection of cases, which involves also the decision whether a full thickness or lamellar graft should be used. The supply and preservation of donor material, formerly a major administrative problem, is now less worrying; the training of personnel is the main problem now that adequate donor material is available. The biological problems which are to be surmounted are antibody-antigen reaction, vascularization and œdema.

Mandibulo - Facial Dysostosis Associated with Dermolipoma of the Conjunctiva.

L. TRANOS (*Am. J. Ophth.*, March, 1954) reports two new cases of mandibulo-facial dysostosis associated with symmetrical dermolipomata of the eyes. She states that the full syndrome consists of antimongoloid slope of the palpebral fissures associated with colobomata, hypoplasia of the facial bones, abnormalities of the external and middle and inner ear, large mouth, high palate and malocclusion of the teeth, blind fistulæ between mouth and corresponding ear, abnormal growth of hair on cheeks, and possible combination of other abnormalities of the face and skeleton. As a rule the full syndrome does not appear; one or more features may be absent. Mandibulo-facial dysostosis is hereditary. The hereditary type is an irregular dominant, and the affection is attributed to an inhibition of the development of the first and second branchial arches and clefts at the seven to nine weeks period.

Ocular Manifestations in Löffler's Syndrome.

C. M. J. VELZEBOER (*Brit. J. Ophth.*, December, 1953) reviews the literature of Löffler's syndrome and describes a patient who showed ocular complications. The patient, a female, aged thirty-seven years, showed fleeting shadows in the lungs and variable exudates in the right fundus. There was a 46% eosinophilia. After three months the exudates in the right fundus had disappeared, leaving two scars. The author considers that the lesion in the fundus and lung had a common origin, and he regards the fundus picture as due to a dense infiltration by eosinophile cells, œdema and focal necrosis. The condition is probably allergic in origin.

A New Trephining Operation.

F. H. VERHOEFF AND P. A. CHANDLER (*Am. J. Ophth.*, July, 1954) describe a new technique of corneo-scleral trephining which they regard as simpler and less traumatizing than the Elliot trephine method. The conjunctiva is grasped six to eight millimetres above the superior limbus and pulled down so that it overrides the cornea. A small hole, sufficient to admit the trephine, is made in the conjunctiva just above the limbus, and the sclera thus exposed. The sclera is trephined with a 1·5 millimetre trephine, and a buttonhole iridectomy is performed. The conjunctival hole is closed with a catgut suture.

Diagnostic Contact Lens.

M. SARWAR (*Brit. J. Ophth.*, October, 1954) describes a contact lens which simplifies examination of the angle of the anterior chamber and the fundus of the eye. The lens has a power of approximately −120 dioptre sphere. The image produced is virtual, diminished and erect. The normal slit-lamp examination technique is used with the lens. No additional prism or mirror is necessary. The method is much simpler than previously described techniques.

Treatment of Cysts of the Iris with Diathermy Coagulation.

D. VAIL (*Am. J. Ophth.*, October, 1954) discusses the treatment of implantation traumatic cysts of the iris. He states that the disadvantage of removal by iridectomy is that removal may be incomplete, and there is mutilation of the pupil. Irradiation produces variable results. The author recommends diathermy coagulation to destroy the cyst; he describes its successful use in three cases.

Topical Cortisone Therapy for Syphilitic Interstitial Keratitis.

G. O. HORNE (*Brit. J. Ophth.*, November, 1954) presents a report on the use of cortisone in 26 eyes affected with interstitial keratitis. The period of observation varied from six months to over three years. In nearly all cases the immediate response to cortisone was excellent. Relapses were equally well controlled. In only three of the eyes was the final visual acuity less than 6/12.

Iridencleisis in Congestive Glaucoma.

E. G. MACKIE AND K. RUBINSTEIN (*Brit. J. Ophth.*, November, 1954) report on the use of iridencleisis in 110 cases of congestive glaucoma. They recommend the operation as it lowers the tension and provides drainage, it is simple to perform and complications are unusual. In the authors' series there were two cases of sympathetic ophthalmia, one of which resulted in blindness. They do not regard this very low incidence as contra-indicating the operation. The ab-externo incision is recommended.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on September 23, 1954, at Sydney Hospital, Sydney. The meeting took the form of a series of clinical demonstrations by the members of the honorary medical and surgical staffs of the hospital. Part of this report appeared in the issue of April 2, 1955.

Elective Laparotomy for Metastatic Hepatoma.

DR. R. J. MALCOLM and DR. T. E. WILSON showed a female patient, aged thirty-seven years, who on November 8, 1948, complained of pain in the right hypochondrium of three months' duration.

On August 11 a biopsy was taken of a palpable mass in the liver. Microscopic examination showed the tumour to be composed of irregular cords of large cells with abundant eosinophilic cytoplasm lying in a fibrous stroma. The appearance was consistent with malignant hepatoma.

On December 9 part of the right lobe of the liver was excised by Dr. L. Buchanan. The pathologist reported that the specimen was an irregularly shaped piece of liver weighing 450 grammes. The peritoneal surface was nodular and in places rough. Bisection of the specimen revealed a circumscribed ovoid tumour nine centimetres in its maximum diameter. The substance of the tumour was firm and the cut surface was mottled green and white. The minimum margin of surrounding liver tissue at the cut surface was 0·1 centimetre in width.

On September 11, 1951, a palpable abdominal tumour measuring six by six by four centimetres was removed. The patient had been free of symptoms except for being easily tired.

On March 17, 1953, multiple metastases were removed from the omentum, the right ovary, the right Fallopian tube and the peritoneum.

On September 22, 1953, an elective laparotomy was performed, although the patient was symptom-free. Four omental tumours, an umbilical metastasis, the uterus and the left adnexa with an adherent metastasis were removed.

On February 16, 1954, the patient was well, apart from slight weakness present for four months. An elective laparotomy was performed and two omental metastases were removed.

On July 29 an elective laparotomy was performed, and an omental metastasis and a loop of ileum were removed. It was pointed out that the microscopic structure of the metastases had always resembled that of the primary growth. Further elective laparotomies were to be performed until no further metastases were found.

Pharyngeal Diverticulum.

DR. T. E. WILSON showed a male patient, aged seventy-five years, who had complained of increasing difficulty in swallowing for at least ten years. During the past year he had had some regurgitation of food, but had never noticed a swelling in the neck. Despite the loss of one stone in weight in the past twelve months, his general condition was good. Clinical examination revealed no abnormality. On May 2, 1949, X-ray examination with a barium bolus revealed "a well-marked pharyngeal diverticulum with pressure on the œsophagus". However, at that stage he had been advised elsewhere against operation.

On July 8, 1954, a barium bolus X-ray examination revealed an increase in size of the pharyngeal diverticulum, with further narrowing of the adjacent œsophageal lumen. Operation was performed on August 10. Through a transverse incision in the left side of the lower part of the neck a pharyngeal diverticulum about two inches long was removed, the defect in the pharyngeal wall being closed with a continuous chromicized catgut suture reinforced with interdupted cotton sutures. Convalescence was uneventful. On September 6 X-ray examination with a barium bolus showed that the diverticulum had been completely excised and there was no longer any obstruction of the œsophagus.

Granuloma of Rectum.

Dr. Wilson's next patient was a man, aged sixty-one years, who had complained of diarrhœa since 1940. In 1941 he was told that he had an ulcer in the rectum, which healed after a few weeks. Since then he had had a variety of treatment without success. Since March, 1954, he had also complained of weakness, of the loss of one stone in weight, and of pain in the anal canal.

Examination of the patient in March revealed an irregular indurated area about one inch in diameter at the recto-sigmoid region. Its surface was ulcerated, but the edges of the ulcer were not fungating. During the past six months there had been no apparent change in the rectum and no other lesion had been detected.

Repeated biopsies had been performed. On a biopsy taken on June 24, Dr. A. A. Palmer reported that there was no evidence of carcinoma. Intense inflammatory changes were present extending into the muscle, but it was difficult to be certain that inflammation was the primary cause. Similar reports had been obtained on other biopsies. The Wassermann test result was negative, no abnormal constituents except pus cells had been found in the fæces or in curettings of the ulcer, and examination of the blood revealed only a hypochromic anæmia.

Anterior Resection of the Rectum.

Dr. Wilson finally showed a series of X-ray films taken after a barium enema had been given in four cases in which an anterior resection of the rectum had been performed. In the first three cases the original lesion was a carcinoma of the rectum, whereas in the fourth it was diverticulitis. In the first three cases the lengths of time since the operation were one, two and three years, and in the fourth the period was one year. All patients were continent of fæces, and in all the sites of the anastomoses were shown to be as wide as the adjacent bowel.

Rupture of the Pancreas.

DR. S. L. SPENCER showed a young man, aged twenty years, who had sustained an isolated rupture of the pancreas. On February 15, 1953, the patient had been surfing when he was struck in the mid-epigastrium by the bow of a surf ski ridden by two persons. He was admitted to Sydney Hospital with the clinical picture of a ruptured solid abdominal viscus with intraperitoneal hæmorrhage, and a provisional diagnosis of ruptured liver was made. The abdomen was opened and the general peritoneal cavity found to contain only a small quantity of blood-stained fluid; however, the lesser sac was grossly distended with blood, and when the lesser omentum was divided and the blood and blood clot were cleaned out, it was found that the pancreas had been completely severed at about the mid-point of its body, apparently by being nipped against the vertebral column. At the site of division the ends of the pancreas were irregularly lacerated, and were swollen and stained with blood. The main pancreatic duct could not be found for repair, and the body of the pancreas was sutured with interrupted catgut sutures. A drainage tube from the lesser sac was led out through the left loin. A search of the abdomen showed no evidence of injury to other viscera and no fat necrosis. After operation pancreatic fluid drained from the patient for five months, in quantities ranging from approximately 10 to 20 ounces per day. Although he lost weight and showed a fairly severe asthenia, he was fortunately not profoundly affected by the loss of pancreatic fluid, and some two months after the operation he was discharged from hospital, still wearing a drainage tube, and allowed to return to work. The tube was removed and the fistula curetted after four and a half months, and drainage ceased soon after. The patient then rapidly regained his weight and health, and at the time of the meeting was perfectly well, except for a complaint of "slight fullness after a large Sunday dinner". Physical examination showed no evidence of pseudo-pancreatic cyst or other sequela.

Dr. Spencer pointed out that injury of the pancreas in association with other abdominal injuries was not uncommon, but that isolated rupture of the pancreas was rare. Interesting points with regard to the present patient included the fact that the pain experienced was not extreme, as described by Moynihan, and that that was in line with more recent observations. Conservative treatment of pancreatic fistula was usually urged unless the patient's condition was deteriorating, and that method had apparently been justified by the progress of the patient shown.

Unusual Appendicitis.

Dr. Spencer's next patient was a girl, aged nineteen years, who had attended the out-patient department in October, 1953, complaining of a discharge from an opening just below the right twelfth rib and about four inches from the spine. She stated that about five months previously she had been bumped in that region by a "Dodg'em", after which a lump had appeared which had broken down and discharged since. There was no history of previous illness, and apart from

some pain in the region described there were no symptoms referable to the abdomen or to any of the systems. The opening in the loin showed no special characteristics, and a probe could be introduced for about two inches in a forward and downward direction. The discharge was of a thin sero-purulent type. Examination of the abdomen gave negative findings, as did a general physical examination, apart from the abnormalities already described. The discharge was examined and X-ray films were taken of the right lower ribs and of the spine. The right renal tract was examined by excretion pyelography. An attempt was made to inject "Lipiodol" down the track for X-ray visualization, but the contrast medium entered only a short distance, and that examination, like the others, failed to yield any useful information.

As the opening showed no signs of healing and the cause remained obscure, it was decided to admit the patient to hospital and to carry out an exploration. Under anæsthesia it was found possible to introduce a probe to a depth of about four inches, and it then became obvious that the track was leading across the crest of the ilium towards the right iliac fossa. That aroused the suspicion that a diseased appendix might underly the condition, and the patient was turned onto her back to permit of exploration through a grid-iron incision. That showed an appendix which had obviously been the seat of an inflammatory process with probable abscess formation. The remnants of the appendix were removed and the wounds sutured. The discharging fistula had not returned, and the patient had remained well. She still steadfastly denied having experienced pain in the front of the abdomen at any time.

Dr. Spencer said that he had not previously encountered a case of appendicitis presenting in that form.

Cirsoid Aneurysm.

The last patient shown by Dr. Spencer was a man, aged fifty-three years, who had noticed all his life that his left ear had been larger than his right ear. About eight years previously it increased greatly in size, with the development of obvious enlargement of the blood vessels. Over the previous five years profuse hæmorrhage had occurred on three occasions, after minor trauma. Three unsuccessful attempts had been made at another hospital to cure the condition by surgical operation; they had included ligation of the left external carotid artery.

Dr. Spencer considered that the diagnosis was one of cirsoid aneurysm involving mainly the left pinna and the region immediately behind, below and in front of the ear. Pulsation was visible and palpable, and there was a systolic bruit which was evident to the patient, though fortunately not distressing. In view of the risk of extension of the lesion and of further hæmorrhage, Dr. Spencer considered that further surgical intervention required serious consideration.

Dr. Spencer went on to say that management of the aneurysm posed two main problems. The first was the control of hæmorrhage during operation. The aneurysm seemed to be fed mainly from the left side, as compression of the left common carotid artery caused a considerable diminution in size and pulsation. It was considered that a second ligation of the external carotid was unlikely to be either practicable or effective, and two methods which suggested themselves were the use of a tape around the common carotid for temporary occlusion during the difficult stages of the operation, or the employment of hypotensive anæsthesia. The second problem was that of the cosmetic result. It was thought that the pinna could not be saved, and that any plastic operation was unlikely to be feasible. In that, Dr. Basil Riley concurred. It appeared that skin grafting of any raw area should be carried out, and that resulting disfigurement could best be relieved by the wearing of a prosthesis.

Appendiceal Abscess Simulating Carcinoma of Sigmoid Colon.

DR. J. M. YEATES showed a man, aged sixty-eight years, who had been admitted to hospital in January, 1954, with a history of constipation for the last three or four days, vomiting and some lower abdominal pain. On examination of the patient, his abdomen was found to be considerably distended. His temperature was normal. The diagnosis of subacute intestinal obstruction was made. During the next few days his symptoms subsided somewhat, and a barium enema was given and an X-ray examination made. This showed a filling defect in the sigmoid colon, which was considered to be due to carcinoma. The patient was prepared for operation during the next week and was given phthalylsulphathiazole by mouth; but a chronic abscess was discovered coming from the appendix region. Part of that almost solid pus involved a loop of sigmoid colon. Appendicectomy did not seem feasible at the time.

The patient was instructed to return in six months, and his appendix was removed without difficulty in July, 1954. At that time there was little or no evidence of the previous suppuration. A recent X-ray examination with a barium enema revealed no abnormality in the sigmoid colon.

Carcinoma of the Caecum Simulating Appendiceal Abscess.

Dr. Yeates's second patient was a man, aged thirty-one years, who had collapsed in the street in December, 1952, with a severe pain in the right iliac fossa. He was admitted to hospital and operation was performed, the diagnosis being phlegmonous type of appendiceal abscess. The appendix was not removed. He was discharged from hospital and instructed to return in three months for interval appendicectomy.

He was first admitted to hospital under the care of Dr. Yeates in June, 1953, again complaining of severe pain in the right iliac fossa. A palpable, fluctuant mass was evident in his right iliac fossa, and this was drained. Attempted culture of the pus failed to yield any growth of organisms. The wound did not heal completely, and repeated cultural examinations, particularly for actinomycosis and tubercle bacilli, failed to reveal any significant organism.

After several months of out-patient treatment, it was decided that laparotomy should be performed; a carcinoma of the caecum was discovered and resected. The pathological report stated that the specimen consisted of the caecum, the appendix, part of the ascending colon and the terminal portion of the ileum. The anterior half of the caecum was occupied by a carcinomatous ulcer measuring six centimetres in its maximum diameter. The growth extended into the muscle coat of the caecum and six centimetres along the ileum. The lumen of the ileum was reduced, but there was no evidence of obstruction. Microscopic examination of sections confirmed the diagnosis of mucus-secreting adenocarcinoma. Metastatic carcinoma was not found in 13 lymph nodes examined.

Block Dissection of Malignant Glands of the Neck.

The next patient shown by Dr. Yeates was a man, aged sixty-three years, who complained of white patches on the floor and side of his mouth, present for many years. Towards the end of 1953 one of these patches had become harder. He was treated with radiotherapy and the lesion subsided entirely.

However, early in 1954 a hard lump was observed on the right side of his neck. On examination of the patient at that time, there was no evidence of carcinoma in the mouth; but a large, hard, fixed gland was visible and palpable about one inch behind the angle of the jaw. There was no evidence of involvement elsewhere.

Operation was performed on March 15, when radical block dissection was carried out in complete accordance with the technique recently described by Howard Eddey, of Melbourne. This involved the removal of all the sterno-mastoid muscle and internal jugular vein. The pathologist reported that the specimen consisted of a mass of fat and muscle with the submandibular salivary gland and internal jugular vein, weighing 175 grammes. An enlarged lymph node measuring 2·5 by 1·5 centimetres with a necrotic centre was present, situated near the upper border of the mass, close to the submandibular gland. Microscopic examination revealed metastatic carcinoma in the lymph node, and the growth extended into the adjacent adipose tissue. No growth was detected in the lower lymph node sections.

After operation the wounds healed well, but there was considerable œdema of the right side of the face. This flattened out the wrinkles and gave the appearance of facial palsy. It was several months before the œdema subsided entirely.

In discussing the case, Dr. Yeates commented that malignant glands in the neck were often slow to metastasize and that radical surgery was therefore often rewarded. At the time of the meeting there was still no sign of recurrence at the site of the primary lesion, but a careful follow-up was being conducted.

Malignant Melanoma during Lactation.

Dr. Yeates's fourth patient was a woman, aged twenty-nine years, who had presented with the history that eight months previously she had noticed a small lump in the palm of her left hand. At that time she was four months

pregnant. The lump was pinkish in colour. It grew fairly quickly for two months, and then remained the same size for the next six months. It bled at times after minor injury.

Local excision was performed early in November, 1953, and the lesion was found to be a malignant melanoma. The patient was instructed to wean her infant. Although the axillary lymph nodes were not enlarged on clinical examination, in the light of that report, block dissection was deemed advisable and was carried out a few weeks later. However, microscopic examination of the axillary glands revealed minute metastases of melanoma in several of the lymph node sections. The metastases did not appear to be growing very actively. Dr. Yeates said that it seemed likely that in that case pregnancy and lactation had stimulated activity in the melanoma.

Malignant Lymphoma of Parotid Region.

Dr. Yeates next showed a man, aged forty-five years, who complained of a painless lump in the left side of his neck which had been present for about six months. The lump had been gradually increasing in size, but had grown more rapidly in the last few weeks. Examination revealed a small rounded lump about the size of a marble in the left parotid region. There was no evidence of enlargement of other glands. The lesion was diagnosed as a mixed parotid tumour, and it was excised in July, 1954. However, pathological examination of sections showed that the tumour was a malignant lymphoma involving a lymph node and infiltrating adjacent fat and a salivary gland; giant cells of the Reed type were in places numerous, which suggested that the condition was a variety of Hodgkin's disease. The patient was then given a course of irradiation to the cervical glands. At the time of the meeting he showed no sign of recurrence.

Perforated Appendix with General Peritonitis.

Dr. Yeates's sixth patient, a man, aged thirty-five years, had been admitted to hospital on June 30, 1954, with the complaint that for the previous three days he had suffered from epigastric pain, anorexia, vomiting and also constant diarrhœa. On examination of the patient, his temperature was 103·6° F., his pulse rate was 130 per minute and his blood pressure was 80 millimetres of mercury, systolic, and 50 millimetres, diastolic. Generalized abdominal tenderness was present, but no very pronounced rigidity. The diagnosis was somewhat confused by early pneumonia at the base of the right lung.

Operation was performed through a muscle-cut incision in the right iliac fossa. Much thin pus poured from the wound, but the appendix could not be located. The incision was extended several times, and the appendix was eventually found, gangrenous and perforated, stuck to the posterior abdominal wall high up behind the ascending colon. The appendix was removed in pieces and invagination of the stump was impossible. Much thin purulent fluid was then aspirated, and a large drainage tube was inserted through a stab wound. The incision was closed with continuous stainless steel wire sutures.

Post-operative treatment consisted in the administration of large doses of penicillin and streptomycin, and continuous suction was maintained by a silent electric pump attached to the drainage tube. By means of this a pint of pus was removed in the first twenty-four hours. In view of the extent of the peritonitis, the post-operative course was reasonably uneventful, the only complication being infection of the operation wound.

Questioned about the use of the suction pump, Dr. Yeates said that that was not a new form of treatment, but one which tended to be neglected. In his view the method was valuable, and there was also the advantage that the pus was collected in a container. That added to the patient's comfort, and reduced the need for repeated change of dressings. A perfectly quiet motor was desirable if sleep was not to be disturbed.

Elective Gastrectomy for Repeated Perforation of Pyloric Ulcer.

Dr. Yeates finally showed a man, aged fifty-four years, who had been admitted to hospital in January, 1954, with a perforated gastric ulcer which was oversewn. He gave a history that he had suffered a similar catastrophe six years previously, and had been treated in the same manner at Saint Vincent's Hospital.

It was decided that, in view of the tendency to perforation, a gastrectomy should be performed, even though the patient seemed to have few dyspeptic symptoms. After a suitable period of convalescence and preparation, elective gastrectomy (ante-colic Pólya-Hofmeister type) was performed in March. The pathological report stated that the specimen consisted of a portion of a stomach measuring 18 centimetres along the greater curvature. There was an almost healed ulcer 1·7 centimetres in diameter on the lesser curvature. Microscopic examination showed no evidence of carcinoma in four sections. Some sutures from a previous operation were present in the floor of the ulcer.

The patient was discharged from hospital nine days after operation, and at the time of the meeting was free of all symptoms, eating well and actually gaining weight.

Von Recklinghausen's Disease and Giant Tumour of Groin.

Dr. E. M. Cortis showed a patient suffering from multiple neurofibromatosis, with a giant benign neurofibroma weighing 11 pounds attached by a pedicle to the right groin and containing a traction hernia. The tumour had been removed by Dr. K. Starr, and the hernia repaired.

Perforation of Anastomotic Ulcer Treated Conservatively.

The next two patients whom Dr. Cortis showed had suffered from perforation of an anastomotic ulcer, which had been treated conservatively. The first patient had had a gastroenterostomy previously, and the second a partial gastrectomy. Dr. Cortis said that one should consider conservative treatment, particularly for perforated anastomotic ulcer, because the left paracolic gutter acted as a better "watershed" than the right, and limited the extent of peritoneal soiling more effectively.

Torsion of Pedicle of Large Ovarian Cyst.

Dr. H. K. Porter and Dr. A. A. Moon showed a woman, aged seventy-four years, who had suffered from fullness in the right side of the abdomen for two months, and from pain in the right side of the abdomen for one week, relieved by the passage of flatus. She had had no vaginal bleeding or discharge, and had no urinary symptoms. She had two children, aged respectively forty-one and forty-two years; both deliveries had been normal. Her menstrual periods had been regular, occurring every twenty-eight days and lasting for three days; her last menstrual period had occurred in 1927 after hysterectomy.

Examination of the patient revealed a large right-sided abdominal mass. At operation a right ovarian cyst was found, measuring 10 by 5 by 4 inches; it had a twisted pedicle and filmy adhesions to the bowel and omentum. No free fluid was present. The pathologist reported that the specimen was a "skull-shaped" cyst measuring 20 by 16 by 14 centimetres; blotchy congesion was present on the surface, and the cyst contained deeply blood-stained fluid; the lining was covered with "mulberry-like" projections of deep red colour; the pedicle was infiltrated with blood.

Microscopic examination revealed torsion of the pedicle, with complete necrosis of the lining and much of the wall. The cyst was thought to be a cystadenoma.

It was pointed out that interesting features were: (i) the age of the patient, the size of the tumour and its asymmetry; (ii) the symptoms of slow and incomplete torsion of the pedicle without signs of an acute abdominal emergency; (iii) the difficulties in differentiating a simple twisted cyst from ovarian carcinoma, on account of the age of the patient, and the history of increase in size of growth associated with pain and tenderness.

The Fenestration Operation for Otosclerotic Deafness.

Dr. D. G. Carruthers read a paper on "The Fenestration Operation for Otosclerotic Deafness". This paper will be published in another issue of the journal.

Laryngectomy for Cancer.

Dr. D. G. Carruthers and Dr. Frank Ellis presented a summary of the present position with regard to laryngectomy for cancer, and showed a patient. It was pointed out that the prospect of laryngectomy and all that it entailed was something from which most would shrink, except for the fact that cancer was a foe which brooked no hesitancy or chance-taking in the primary attack. There were few second opportunities. The only method of treatment worth contemplation at all was one which might reasonably be expected to effect a cure at the first endeavour. Improved surgical technique, the better understanding of resuscitative and restorative procedures and their ready availability, along with prophylactic exhibition of antibiotics, had rendered the

operation of laryngectomy and gland excision reasonably safe, so that most patients now would survive the actual operation and healing. The occurrence of cervico-pharyngeal leaking fistulæ could largely be avoided by meticulous care in suturing the pharyngeal mucosa, by overlying reinforcement with available neck tissues, and finally by careful introduction and adequate maintenance of a fine soft feeding tube and then cautious resumption of natural swallowing.

The development of œsophageal speech so that the patients were able to resume some profitable occupation had removed the horrifying prospect of inability to make heard one's needs, or to converse sufficiently to continue in useful employment. The acquisition of skill in that form of substitute voice called for courageous perseverance by the patient, and skilled instruction and supervision. Teachers were becoming more experienced and more expert, and the achievements of their patients were highly gratifying.

The alternatives to laryngectomy were radium and deep X-ray therapy, or perhaps an attempt at cure by some more conservative surgical procedure, such as partial resection of the involved parts through median thyrotomy (laryngofissure). Any decision to adopt conservative measures could be based only upon a certain estimate that the lesion was confined to readily excisable or radio-accessible parts. Therein lay the major problem. A cancer confined to the anterior two-thirds of one vocal cord and not extending to the tissues above or below it could usually be completely removed by transthyroid resection of the one vocal cord, or might often be destroyed effectively by irradiation. Cancers which extended above or below the cord, or which involved the posterior third sufficiently to restrict movement, were usually too extensive already to be excised with certainty in a conservative operation, and might already have reached the cervical glands. A type of cancer now realized to be fairly common was that called *cancer in situ* of the vocal cord. That lesion was likely to be very deceptive, for often it had already extended well back to the arytænoid cartilage without greatly restricting movement and without extensive fungation or ulceration. The cancer development in that type of case remained for long confined to the epithelium of the cord. It might well be able to be completely excised or even irradiated, provided that its true extent was recognized and operation or treatment was thus designed to reach the healthy margin all around it. A diffuse, reddened thickening of the major or whole length of the vocal cord, although there might be quite good movement remaining, should always cause the laryngologist to suspect that a vocal cord cancer was of this type. He would thus avoid the error of thinking that, because the cord was still movable, or the ulcerative or hypertrophic or fungating lesion affected mostly the anterior third or two-thirds, then the lesion was circumscribed. The rounded, thickened and perhaps reddened portion of the cord further back was likely to be malignant, too. The pathologist, of course, would usually recognize the intraepithelial quality of the lesion, and would draw attention to its known habit of wide extension along the length of the epithelial layer before it broke bounds. Nevertheless, the lesion was truly malignant, and unless it was completely excised or fully exposed to adequate irradiation, it would surely recur and would eventually show all the well-known tendencies to involve glands and to form remote meastases. The only safe way with cancer was to deal with it in the manner most likely to provide a complete cure, at the first attack. Recurrences were rarely curable.

The patient shown was a man, aged fifty-five years, who had noticed huskiness for about nine months. He had no other symptoms referable to the nose, throat or lungs. X-ray films of the chest revealed no abnormality. Indirect examination of the larynx under local anæsthesia revealed a hyperkeratotic lesion on the upper surface of the right vocal cord at the anterior third. There was some limitation of movement of the cord, but both arytænoid cartilages moved freely. Direct examination of the larynx under general anæsthesia revealed a softish hyperkeratotic lesion with some œdema on the upper surface of both vocal cords. There was quite good movement of both cords. A biopsy revealed squamous carcinoma of the right vocal cord, and early malignant changes in the left vocal cord.

Three forms of treatment were considered. (*a*) Laryngofissure and removal of the anterior half of both vocal cords would have left very little voice and great likelihood of stenosis of the airway necessitating long after-treatment. Total eradication of the disease was uncertain. (*b*) If X-ray therapy or radium implantation was used, total eradication of the disease was uncertain, and the technical problems of irradiating both cords and the anterior commissure added to the uncertainty. (*c*) Laryngectomy seemed the best idea. The parts were again examined under anæsthesia and considerable subglottic involvement was noted. Radical operation was considered the only safe procedure to adopt. Laryngectomy was carried out on September 14, 1953, and recodvery was uneventful. The patient was learning œsophageal speech.

Correction of Nasal Deformities.

Dr. D. G. Carruthers also discussed the correction of nasal deformities. He said that two objectives must always be aimed at: (i) to maintain or to improve nasal function; (ii) to restore a pleasing and natural symmetrical appearance of the nose.

The first objective was one for which the experienced nasal surgeon was especially able to plan. For years past the operation of submucous resection of the nasal septum had been a standard procedure aimed at overcoming obstructions of the nasal airways due to deflections and irregularities of the nasal septum. None better than the rhinologist was aware that the drastic resection of the septal supporting framework so frequently performed in the past left much to be desired. There might remain a septum which was straight, but which flapped about in the nose with respiration and might of itself cause great disturbance of function and discomfort to the patient. In other cases removal of the rigid septal support might leave the bridge or tip of the nose without adequate support so that saddle deformities, depression of the nose tip *et cetera* might result. The procedures adopted at present provided for far greater use of the septal supporting structures, which whenever possible were retained after being rendered mobile like a door on a hinge, and might thus, in great part at least, be replaced into a correct mid-line position. That cleared the airway on each side and often improved rather than lessened the support of the nasal bridge and tip.

The second objective was to restore a pleasing appearance of the nose. Dr. Carruthers said that with many gross septal deflections, especially those anteriorly placed, the tip of the nose was often carried to one side or the other and might be of grossly asymmetrical appearance. Likewise the columella might be thickened, asymmetrical and collapsed from want of a good central support. It was now widely appreciated that much of that type of deformity was able to be overcome by operations on the anterior position of the nasal septum. However, merely to resect displaced septal cartilage would not achieve that objective. The displaced cartilaginous support could be restored to useful purpose by being so freed that it was able to be reset into positions in which not only would the airway be opened out, but unsightly thickenings in the columella and nasal tip displacements could be corrected, with restoration of the septal support to its proper position. In many cases it was readily appreciated that, owing either to traumatic displacement of parts or to asymmetrical growth, perhaps in an uncorrected deformity, the complete restoration of a pleasing natural appearance to the nose called for additional measures aimed to build up depressions of the nasal bridge or to remove hump-like prominences of the parts. Lack of symmetry might call for trimming of the bony or cartilaginous framework of the nasal arch, alæ and columella, and perhaps for small additions of tissue on the opposite side.

Dr. Carruthers said that those procedures achieved the twofold objective of correction in many cases of nasal deformity and septal deflection in the current conception of that problem. There was, of course, in addition the still wider field of replacement surgery, in which soft parts were missing and had to be restored by various pedicled flaps and skin grafts. That demonstration did not aim to go into details of those aspects of the problem. Dr. Carruthers showed slides illustrating the utilization of a segment of the septum as a swinging door, mobilized so that it could be swung into a mid-line position where it would be of use in the general support of the septum and of the nose itself. In small and large segments the principle might be applied in several parts, any actual resection of bone or cartilage being reserved as far as practicable for segments forming sharp ridges or spurs well back or low down near the nasal floor.

Dermatological Conditions.

DR. FRANK SMIDLIN showed three patients with skin lesions.

The first was a female patient, aged twenty-two years, with *lupus erythematosus* of the whole of her face and of the sides of her neck of four years' duration. Atrophic areas were present on both forearms on previously affected areas.

The second patient was a female, aged twenty-two years, with *prurigo nodularis* of both legs of four years' duration. Numerous verrucous lesions were present, and she had a history of extreme and persistent pruritus.

The third patient was a man, aged fifty-six years, who had a kerato-acanthoma of the forehead of three months' duration. Interesting points were the lack of induration and infiltration of the lesion, with cessation of growth over the last few weeks.

White Spongy Nævus.

Dr. L. G. Abbott and Dr. L. A. Musso showed a male patient who presented a typical white spongy nævus of the mouth, as described originally by Cannon. The lesions were restricted to the buccal mucosa and had been present for a known period of twelve years; there was no family history of the disease. Histopathological examination revealed pronounced acanthosis with pigment formation and vacuolation of the squamous cells; the findings were characteristic.

Congenital Torticollis.

Dr. A. I. Rhydderch showed a female patient, aged twenty-nine years, who had first been examined at the orthopædic out-patient department on July 29, 1953. She was referred by the medical clinic because of persistent headaches, associated with severe torticollis. The patient stated that the torticollis had been noticed in the early weeks of her life, but her parents had refused permission for any treatment. The tilting of her head had become progressively worse over the years. On examination the patient had a pronounced right torticollis with hemiatrophy of the face. The deformity was partially corrected by forcible passive movement. She also had a compensatory thoracic scoliosis to the right, fortunately still mainly postural.

On September 19, 1953, the sternal and clavicular heads of the right sterno-mastoid were divided by open operation. Good correction was obtained. After operation the patient had stretching exercises and wore a halter for some weeks. She had been observed over the past twelve months, and no relapse had occurred. She had had no headaches since the operation.

Dr. Rhydderch said that the interest of the case lay in the fact that excellent correction could be obtained so many years later than the customary time. Prior to operation only limited correction had been expected.

Delayed Union of the Humerus.

Dr. Rhydderch's second patient was a man, aged thirty-five years, who sustained a closed fracture of the mid-shaft of the right humerus in May, 1953. The fracture line was oblique. There was no concomitant radial nerve injury. The fracture was initially treated with a U slab, and when union was obviously delayed the limb was placed in a shoulder spica. The patient was referred to the orthopædic department on August 14, 1953, because of delayed union.

On examination of the patient there was considerable mobility at the fracture site. X-ray examination did not reveal any union. The fracture surfaces appeared indolent. There was no sclerosis.

On September 10 the fracture was exposed by the antero-lateral approach to the humerus. The bone ends were freshened. The ends were extensively drilled and immobilization was secured with a vitallium plate and screws. The upper limb was then placed on an abduction frame. The immobilization was continued until November 9. X-ray examination on that date disclosed extensive callus, though union was far from consolidated. Serial X-ray examination over the next few months revealed consolidation of the fracture. The patient returned to labouring work in January, 1954.

Non-Union of the Tibia.

Dr. Rhydderch finally showed a man, aged fifty-two years, who had been struck by a taxi cab on August 10, 1953. He sustained closed fractures of the left tibia and fibula in the mid-shaft. The fracture line was transverse. The fractures were reduced under general anæsthesia and immobilized in a long leg plaster. The position of the fragment throughout the immobilization was always satisfactory. On January 19, 1954, after five months' immobilization, the tibial fracture was still mobile. There was no attempt at union and there was a suggestion of sclerosis of the fracture ends. The immobilization was discarded and movement was encouraged, in an endeavour to regain maximal movement of the joint and to restore tone to the skin prior to further surgical intervention.

On February 12 the fracture was approached through a curved flap incision. The bone ends were freshened. Extensive drilling of both fracture ends was carried out. The fracture ends were held in apposition by a vitallium plate and screws, and cancellous chips, taken from the ilium, were implanted around the fracture site. The limb was immobilized in plaster of Paris until April 29. The plaster was removed and an Unna's paste stocking was applied. The patient was fitted with a walking caliper. On July 15 X-ray films showed the fracture to be soundly consolidated, and the caliper was discarded.

Dr. Rhydderch said that the fracture in this case differed from that in the previous case, in that the fracture surface exhibited sclerosis of the bone ends, the herald of non-union. In such instances it was probably wise to add cancellous bone to the usual bone drilling and fixation.

Hysterical Fugue with Retrograde Amnesia Treated by Narco-Analysis.

Dr. I. A. Listwan showed a girl, aged eighteen years, who had disappeared from her home four days before her first visit to the hospital. She was found three days later by the police, and could not account for her movements during those three days. The reasons for this were firstly, complete retrograde amnesia for that period, and secondly, complete mutism. When she was first examined she was standing in a corner in a stiff position and did not respond to visual or tactual stimuli. She would hold her arms indefinitely when they were raised, and showed a complete anæsthesia of her whole body. She also showed propulsion and retropulsion. Her father could not or would not say much to increase the knowledge of her behaviour before the episode. The differential diagnosis between hysteria and schizophrenia of the katatonic type was considered, and narco-analytical treatment was decided on in order to clear the differential diagnostic points and perhaps effect some improvement. Success was achieved in both objects.

The patient's mutism disappeared even before "Pentothal" was administered. The method used was strong suggestion with the use of a musical stimulus. The patient was encouraged to sing, and a singing nurse produced that stimulus. After the patient had been given "Pentothal" she started to talk freely and showed no signs or characteristics of a schizophrenic reaction type. In the first part of the interview she chose to discuss her family situation, which centred around rivalry between the patient and her young stepmother for the father. That rivalry was accentuated when the stepmother had a baby, and finally reached a climax when her neurotic father attacked her bodily in one of his tantrums, attempting to strangle her. The patient's love for her dead mother found no acceptance in the present family situation, and the patient took her mother's part in voicing accusations against her father. Hate and love for her father produced an ambivalence in her, leading finally to an hysterical fugue fortified by two conversion symptoms, amnesia and mutism. Dr. Listwan said that child-parent fixations were coupled with instinctive impulses to incest and therefore were deeply repressed. In spite of that, part of the dynamics in the patient's situation was revealed by the patient in the first part of the interview, and after she had found an expiation by confession her amnesia was not purposeful for her any more and was lifted to consciousness. Later she described in detail her less relevant whereabouts during the three days of her amnestic fugue.

The session was recorded on a sound track and played back to the patient to keep the material conscious and verbalized. The opportunity was given for the patient to bring more repressed memories back and abreact them in the waking state. The patient's condition improved under this treatment.

Dr. Listwan said that the demonstration, which followed previous demonstrations in 1953, showed again the possibility of a short-cut unearthing of the necessary traumatic material due to family conflicts. Secondly, the method made possible a differential diagnosis between such entities as hysteria and schizophrenia. Finally, Dr. Listwan stressed the teaching value of a sound track in psychiatry.

Compulsive Laughter and Crying with Pseudo-Emotional Reaction Type.

Dr. Listwan's next patient had been investigated from the neurosurgical point of view by Dr. W. Scott Charlton, who had provided the relevant reports. The patient was a man, aged fifty-one years, who had been in a motor-car accident two and a half years earlier, and had sustained a fracture of the jaw, but had not lost consciousness. He did not work for ten months; he then worked for one year and collapsed over the wheel of his motor-car. Since the accident he had become irritable, good humour alternating with fits of crying; he was sleepy during the day, his voice changed and he developed a right-sided hemiparesis with involvement of the face. He had no definite bulbar lesions.

However, he lost his speech. On mental examination he showed pronounced emotional lability, depressive mood, irritability, indifference and poor insight, and some defects in comprehension, orientation and memory. Forty cubic centimetres of air were introduced by lumbar puncture, and diffuse atrophy of the brain more pronounced on the left side was seen. A plain X-ray film of the skull, a Wassermann test, a full blood count and urine examination gave negative findings. After the pneumoencephalogram the patient spoke on several occasions over a period of a few weeks. That was perplexing, as he had been unable to speak for the last few months and his condition was considered to be one of irreversible asphasia. Instead he developed compulsive laughter or crying. It was thought possible that the general anæsthetic given to the patient lifted inhibitions acting on the speech centre and the cortical mechanism controlling laughter and crying. A frontal lobe or mid-brain lesion could be responsible for the syndrome. Dr. Listwan said that the speech centre and emotional mechanism were involved in left temporal lobe lesions in right-handed persons. The patient was able to understand speech and perform any commands given to him. His intellectual faculties improved instead of deteriorating, and his compulsory reaction had to be considered pseudoemotional.

Urological Demonstration.

DR. H. H. PEARSON and DR. J. E. BLACKMAN showed a number of patients with surgical urological disorders.

Prostatic Carcinoma Treated by Total Prostatectomy.

Dr. H. H. Pearson first showed a patient with early carcinoma of the prostate which had been treated by total prostatectomy. The patient, aged fifty-one years, had attended six months previously with symptoms of bladder neck obstruction increasing over the previous two years. Early carcinoma was diagnosed by rectal examination. It was thought that he would do well with total prostatectomy, and he was admitted to hospital for full urological investigation. The serum acid phosphatase content was 4·3 King-Armstrong units, and X-ray examination of the lumbar part of the spine and the pelvis showed no sign of spread to bone. The response to five milligrammes of stilbœstrol three times a day was remarkable, and confirmed the diagnosis.

On April 28, 1954, total prostatectomy, including removal of the seminal vesicals intact, was performed by the retropubic approach, the bladder neck being sutured directly to the distal part of the urethra over a catheter. At the time of the meeting the patient had clear urine with complete urinary control. Dr. Pearson showed a specimen from which several sections had been taken, histological examination of which had confirmed the diagnosis.

The next patient shown by Dr. Pearson was a man, aged sixty-seven years, who had complained of symptoms of increasing frequency of micturition and of nocturia. A cystographic examination showed the typical appearance of a large filling defect caused by carcinoma in the diverticulum. A cystoscopic examination showed the growth in the diverticulum to be presenting at the neck of the diverticulum, but the bladder was otherwise clear. The growth was removed entirely, together with the diverticulum, the combined intravesical and extravesical approach being used. The bladder was drained with a suprapubic tube. Dr. Pearson showed coloured slides of the diverticulum removed *in toto*; histological examinations of sections showed the growth to be a grade III carcinoma.

Bladder Neck Obstruction.

Dr. J. E. Blackman then showed a number of patients demonstrating various types of bladder neck obstruction. Included in the demonstration were cystograms and cystoscopic views in colour.

The first patient was a man, aged sixty-six years, who had attended the out-patient clinic complaining of obstructive symptoms of six months' duration, and of incomplete emptying of the bladder. Rectal examination revealed a small to moderately enlarged prostate, and the bladder was palpable two fingers' breadth above the symphysis. Cystograms showed a large posterior diverticulum lying in the hollow of the sacrum. At cystoscopic examination the diverticulum could be inspected, as the beak of the cystoscope passed easily through the neck. The diverticulum was removed by combined intravesical and extravesical approach, and the prostate was enucleated transvesically. The bladder was enclosed around a Winsbury-White's tube.

The next patient shown by Dr. Blackman was a woman, aged sixty-four years, who had an unusual bladder neck obstruction from a carcinoma of the bladder involving the urethra. She was a patient of Dr. H. H. Pearson, who had performed on her a synchronous combined removal of bladder, urethra and anterior vaginal wall, the ureters having been previously transplanted into the colon. Dr. Blackman said that the case would be reported in full elsewhere.

Dr. Blackman then demonstrated the use of a Riches suprapubic catheter in a man with retention of urine with overflow incontinence and a large atonic bladder. The bladder had been drained three weeks before retropubic prostatectomy was performed. A small Riches tube left the field of operation quite clear for the secondary procedure.

Other patients shown included one with obstruction from a median bar, and one with Marion's disease of the bladder neck, treated by transurethral resection.

Aneurysm of Renal Artery in a Solitary Kidney

DR. IAN F. POTTS showed a female patient, aged sixty-five years, a plain X-ray film of whose abdomen had revealed a crescentic calcified shadow over the right renal area. Most investigations gave normal findings. An aortogram showed that the shadow was calcification in the wall of an aneurysm of the renal artery. It was also seen that arteriosclerosis of the aorta and of the right renal artery was present, that the left kidney was missing, and that a second small aneurysm was present on the renal artery.

Microscopic Hypernephroma Showing Venous Invasion.

Dr. Potts also showed a male patient, aged forty-five years, who had experienced painless intermittent hæmaturia for six months. Pyelograms, intravenous and retrograde, gave normal findings. Cystoscopic examinations revealed that the bleeding was always from the left side only. Left nephrectomy was performed. Pathological study of the specimen showed it to be a Grawitz tumour 1·0 millimetre in diameter. Near by was a medium-sized vein which contained a group of tumour cells. Dr. Potts said that the case was of interest because of the extremely small size of the primary tumour, which had already invaded a vein.

Neurosurgical Conditions.

DR. W. SCOTT CHARLTON, DR. G. N. ARTHURS and DR. H. ASSHETON-CHIN (honorary dental surgeon) showed patients who had undergone neurosurgical procedures. Two of the patients had had pituitary tumours removed. One patient suffering from post-traumatic epilepsy due to an extensive cerebral scar was also shown; the patient had been operated on two years previously, and had also at the same time had a skull defect closed by cranioplasty.

Cranioplasty.

A patient was shown who was due to undergo cranioplasty the following week. The skull defect was pronounced, including the frontal region, the bridge of nose and the left supraorbital ridge. With him was also shown the contoured tantalum plate, taken to the stage at which it was ready for the final fitting in the operating theatre.

The second patient had had a similar defect to the first, but the plate had been fitted three months earlier, being held in place by tantalum screws. Normal contour had been restored, and since the incisions had been made within the hair line, no visible signs of the restoration were evident. On running the finger over the bridge of the nose, supraorbital ridge or frontal region, the edges of the plate were not evident.

The third patient had such a large defect that no available sheet of tantalum was large enough to cover it. Therefore it was restored with an acrylic resin plate with tantalum lugs inset round the edges. The lugs rested over the bony edges, and obviated the need for cutting a channel in the bone around the periphery of the defect. Initial retention, as in the other cases, was by tantalum screws, in this case through the lugs.

Lupus Erythematosus.

Sections were presented by the department of morbid anatomy to illustrate histological changes in the kidney, spleen and lung in cases of disseminated *lupus erythematosus*.

DR. E. HIRST presented a demonstration of slides and photographs illustrating the L.E. phenomenon in peripheral blood. The criteria for diagnosis were demonstrated.

DR. H. S. H. WARDLAW showed electrophoretograms of serum of patients with *lupus erythematosus*. He demonstrated the method of obtaining the curves by paper strip electrophoresis of the serum proteins.

Carcinoma of the Larynx.

Dr. F. Ellis presented a man, aged sixty years, who had presented himself on May 25, 1954, with the complaint of hoarseness for six months. Laryngoscopy showed a small round nodule on the middle of the right vocal cord. Movements of the right cord were restricted slightly. Biopsy on June 11 showed squamous carcinoma, grade II.

Laryngofissure was performed on July 9. The thyroid cartilage was divided at its anterior border, and the laminæ were turned outwards to expose the interior of the larynx. The diseased vocal cord was removed in its entirety. Biopsy specimens were taken from the edges of the excision. The thyroid laminæ were closed, and the skin was sutured. Recovery was uneventful. The pathology report revealed epidermoid carcinoma in all sections; removal was not complete.

Laryngectomy was performed on July 21. The patient developed a pharyngeal fistula on the sixth post-operative day. This closed by the twenty-second post-operative day. The patient was up and about from the twenty-fifth post-operative day.

The following pathology report was made:

> Macroscopic: A larynx showing a scar in the position of the right cord due to previous surgery, and what appears to be friable growth involving the anterior end of the left cord and the position of the anterior end of the right cord.
>
> Microscopic: Sections from the surgical scar in the position of the right cord show several residual islands of carcinoma. Section from the region previously occupied by the anterior end of the right cord shows an island of epidermoid carcinoma in the scar tissue. The scar tissue from the position of the anterior end of the left cord does not show carcinoma.

Protruding Ear Treated by Plastic Surgery.

Dr. Ellis's second patient, a boy, aged ten years, had been born with the right ear protruding greatly from his head. An operation had been performed on the lines suggested by Oscar J. Becker, of Chicago. The cartilage of the ear was completely exposed posteriorly by an incision running down the back of the ear. The absent antihelix was replaced by bending the ear to a better shape. The new antihelix was marked first by needles going through the ear from the front aspect, and then by spots of methylene blue placed on the needle punctures posteriorly. Then the cartilage was removed from the back, in amount sufficient to produce a sharp edge to the antihelix inferiorly and a more rounded edge as it approached the superior crus of the antihelix. The *cauda helicis* was removed. Sutures of silk were used to hold the folded pieces of cartilage in their new shape. Redundant skin was removed and the skin wound closed. A small drain was left in the wound. A crêpe bandage was applied. The cosmetic result was satisfactory.

The Needs of the Aged: A Survey of 680 Cases Referred to the Almoner's Department over a Period of Six Months.

Miss K. George (head almoner) and the staff of the Almoner's Department presented a survey of the needs of all patients aged sixty years or over who had been referred to the Almoner's Department between January 1, 1954, and June 30, 1954. During that period, a total number of 680 patients in that age group were sent by medical officers to almoners for assistance. Needs were defined as those seen by the almoner in terms of the patient's medical condition, his social situation, his personality and his understanding of his wants. It was discovered that most of the needs of the patients fell into three main categories—accommodation, nursing care and diversional activity. Other difficulties were recognized, but it was decided to limit the scope of the survey to the more general problems of the aged. In some cases more than one of those needs was evident, though in others none were apparent.

Of the 680 patients reviewed, 160 (24%) had difficulties associated with accommodation, 292 (43%) required help to obtain adequate nursing care, and 22 (3%) lacked appropriate diversional activities.

Accommodation difficulties were caused directly by the housing shortage in 31 cases, by financial stress in 66 cases, and by medical requirements (for example, patients with cardiac conditions no longer able to manage stairs) in 63 cases. A large number of patients needed nursing attention—101 required prolonged or terminal institutional care, 138 temporary institutional care including convalescence and 53 domiciliary care. Diversional or recreational needs were neglected at times because of the urgency of pressing material problems connected with the medical condition. However, the need for light or part-time employment was recognized in 10 cases, for handicrafts in five cases and for social activities in seven cases.

Each need thus revealed was then examined to see if it had been possible to meet it with the community facilities available at present. A categorical answer, "yes" or "no", was given.

Of 31 difficulties due to the housing shortage, it was possible to meet only five; of 66 due to financial stress, nine; of 63 due to medical requirements, 31. Thus, of a total of 160 accommodation difficulties, 45 (28%) were met.

As far as nursing care was concerned, 67 (66%) of the 101 patients needing prolonged or terminal institutional care received it; 133 (96%) of the 138 requiring temporary institutional care including convalescence obtained it; 46 (87%) of the 53 in need of domiciliary care received it. That meant that nursing care was arranged for 246 (84%) of the 292 patients requiring such attention.

Of the 10 patients lacking light or part-time employment, it was possible to secure a suitable occupation for only one patient; of the five desiring handicraft instruction, it was supplied to three; of the seven wishing for increased social activities, five were helped to achieve them. Of a total of 22 diversional needs disclosed, only nine were met.

In some cases needs were met by indirect means, the basic problem remaining unsolved. For instance, except in a few isolated cases, it was not possible to reduce high rents for houses or rooms. Pensioners or other patients on small fixed incomes required supplementary allowances from statutory or voluntary agencies to pay for special diets, clothing replacements and fares.

Although, on the whole, it was possible to arrange for adequate nursing care, some patients suffered hardship because of delays in their admission to suitable institutions. Others received care in private nursing homes at considerable financial sacrifice to themselves or their relatives and friends. In other cases, nursing needs were met only because patients remained in "acute" hospital wards; it was discovered that 19 patients stayed in Sydney Hospital for periods up to four months, waiting for appropriate institutional care.

Generally, needs were not met because existing community facilities lacked the resources to cope with all the demands made upon them. For example, domiciliary nursing services and domestic help agencies were still unable to provide all the care and attention needed by an enfeebled patient in his home. A notable exception was the absence of any body interested in trying to provide useful and gainful occupations for elderly people. In a few cases it was impossible to help patients meet their needs because of personality difficulties. Naturally, in most cases in which a need has been listed as "not met", an attempt was made by the almoner to alleviate a patient's distress and suffering in another way, such as arranging domiciliary care when no suitable institution was available.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

SIR GEORGE GIPPS TO THE MARQUESS OF NORMANBY.[1]

[From "The Historical Records of Australia", Volume 20.]

Government House,
25 July, 1839.

My Lord,

I have the honour herewith to forward a Memorial which has been addressed to your Lordship by the President and Committees of the Sydney Dispensary, praying that the South Wing of the General Hospital may be granted to them for the use of the Public; and I shall endeavour to explain

[1] From the original in the Mitchell Library, Sydney.

to your Lordship the circumstances under which the application is made as well as the considerations which induce me respectfully to recommend a compliance with the prayer of it. The General Hospital alluded to consists of three large and commodious buildings (a centre and two detached Wings) in an elevated and airy part of Sydney. It was built in the time of Governor Macquarie, and having been paid for out of the profits of the Sale of Rum is familiarly known by the name of the Rum Hospital. Until very recently the whole expense of maintaining Patients in it was borne by the Home Government; but nevertheless it is not exclusively a Convict Establishment, free Paupers having, ever since it was opened, been admitted into it as well as Convicts; and it is still the only place in Sydney where Free Paupers can obtain Medical treatment in severe cases, the Dispensary being only, as its name implies, a place for the distribution of Medicines and whereat advice may be had gratis.

According to instructions contained in Lord Glenelg's Dispatch of 29th September, 1837, No. 377, a charge of 1s. 9d. per diem has been made since the 1st April, 1838, by the Commissary General against the Colonial Government for every Free Pauper admitted to the Hospital: but their right of admission on these terms is still acknowledged and at the moment I now write there are no less than 31 Free Paupers receiving Medical treatment there.

It was in order to relieve the Local Government from the heavy charge of paying for these Paupers that I invited (as stated in the Memorial to your Lordship) the People of Sydney to establish a Hospital on the principle of those, which are to be found in most Towns of any consideration in the United Kingdom: and I am happy to say that I have found every disposition to comply with my desire provided the present prayer of the Petitioners be granted by your Lordship.

I think it right, however, to state to your Lordship that some opposition may probably be offered to this arrangement by the Board of Ordnance, without whose concurrence it would not be proper to adopt it, as the Commanding Engineer, Major Barney, has I understand sent home a proposal for converting the same Wing of the Building into a Military Hospital. This proposal I must consider as having been rather hastily made, and not founded on the principles which have hitherto been acted on, whenever any charge has been transferred from the Home to the Local Government. The buildings in question are not Military ones, nor are they properly speaking convict ones: they were erected for general purposes and paid for by money raised in the Colony: according to all precedent therefore, they should be considered Colonial or at least the joint property of the Home and the Colonial Governments: and, if this be conceded, the present proposition may merely be looked upon as one for dividing between two joint owners a property which has hitherto been an undivided one.

I have, &c.,

GEORGE GIPPS.

Correspondence.

YOUNG DOCTORS AND SPECIALIZATION.

SIR: Dr. Daniel Lane is mistaken when he says that time spent in general practice is time wasted for a would-be specialist. I was recently sent to just such a specialist, and that is the first and last time he will see me. I could not regard him as a doctor in any way at all; he seemed more like some kind of business concern, and I could sense something lacking in his training as a doctor. He will probably never realize this—but his patients will.

A doctor earns his living from his patients, and if he wants the job of operating on Mrs. Jones for an abdomino-perineal excision of the rectum, I am afraid he must be prepared to gain her confidence and spend a little time listening to her domestic worries. Otherwise Mrs. Jones will have the operation, but it will be performed by an equally competent surgeon, who has the additional advantage of several years' general practice behind him, where he has learned to listen sympathetically to people like Mrs. Jones.

Dr. Lane says that we do not expect a trainee jet pilot to spend time studying out-of-date planes. Of course not—the inside of a jet plane is very different from that of a plane of long ago. But the inside of a little human being, born this very moment, does not differ in the slightest from one born a thousand years ago. Human beings are human beings—not cases; and no woman, at any rate, will return to a doctor who treats her like a machine. The "jet age specialist" will not draw patients—and patients count.

Yours, etc.,

"NIL TENTES, AUT PERFICE".

Sydney,
March 1, 1955.

MEDICO-LEGAL SOCIETY OF NEW SOUTH WALES.

SIR: As no one seems in favour of reviving this moribund society, I suggest that surviving office-holders take steps to wind up its affairs, according to law.

Yours, etc.,

W. S. DAWSON.

Sydney,
March 3, 1955.

THE MANAGEMENT OF EPILEPTIC CONVULSIONS.

SIR: While Dr. Wilfred Cary's clinical experience (February 19, 1955) is interesting, it is none the less true that experimental evidence is all against paraldehyde as an anticonvulsant, and indicates in fact that this is one of the very few drugs which will sedate a patient without appreciably raising the convulsion threshold. This, of course, does not mean that the drug is clinically ineffective; it may influence one of the obscure ætiological factors other than the convulsion threshold; but having seen more than one drug used for generations by clinicians of repute when in fact they are completely ineffective for the purpose used, one would like to see more definite evidence that paraldehyde is effective in controlling infantile convulsions. Dr. Cary's statement that "results are obtained some fifteen to thirty minutes earlier with paraldehyde than with soluble phenobarbitone" can mean only that the patient goes to sleep earlier, which is, of course, true because phenobarbitone, while sure, is notoriously slow. But if Dr. Cary will try the quick-acting sodium pentobarbitone *per rectum*, first cutting the ends of the capsule, he will not only produce sleep at least as quickly, but will have administered a safe and potent anticonvulsant. Incidentally it is unfortunate that "pentobarbitone" and "phenobarbitone" should look so much alike in print as to be easily confused.

For the record, I did not write that "in [my] experience paraldehyde is of little help in the control of infantile convulsions". I have never used paraldehyde for this condition, on the grounds, which I did state, that "if paraldehyde is an effective anticonvulsant in children, then this is in marked contrast to its effect on the leptazol convulsions of adults".

Yours, etc.,

V. H. WEBSTER.

Peterborough,
South Australia,
February 25, 1955.

AN UNUSUAL CASE OF IRITIS.

SIR: I would like to give an autobiographical report of a case of non-purulent, non-specific iritis of unknown origin.

Just over two years ago, in the middle of summer, I developed a dusky angular conjunctivitis of my left eye. Scant attention was paid to this at first, because pressure of work was great, mainly due to an epidemic of gastro-enteritis. Two days later the painful effect of light on this eye became unbearable, so specialist advice was sought. A diagnosis of non-purulent, non-specific iritis was made of unknown origin, and tests were ordered to disclose the offending focus of infection. Then subconjunctival cortisone was administered with extravagant claims for a speedy cure of the condition.

But alas, as the effect of the local anæsthesia wore off, so did the painful and nauseous symptoms of glaucoma appear. Röntgen rays and various tests failed to reveal a cause, so the patient was doomed to days of loneliness in a dark room with the three "A's" (atropine, "Albucid" and aspirin). To them were added "sulpha" tablets, then jolts of penicillin in impressive amounts.

To one accustomed to pass much time in reading, total abstinence was a real hardship, and despite the untiring

efforts of an understanding ex-nurse wife *plus* the powerful confidence radiated by a most attentive ophthalmic surgeon, the morale sank lower and lower, as day followed day without apparent improvement. But an active mind had to find a use, so it became a repository of news items, popular songs and radio serials. Gregory Keene detailed his nightly chapter of "Dossier on Dumetrius: A Document Now Gathering Dust in a Silent Room" to no more appreciative listener.

Thus passed three weeks of utter misery. Then to the pad and bandage stage—with dark glasses alone on dull days and at night. Fog was welcomed and daylight dreaded. Cortisone was dropped in the affected eye at regular intervals, and a slow and definite improvement followed for some days. Then it ceased abruptly.

At this stage, a neighbouring practitioner, who had suffered from some type of iritis, dropped by and advised the use of chloramphenicol. Capsules were taken in maximal doses, and from the second day, progress was rapid and permanent. So after seven days the three "A's" were discontinued, and a fortnight later medical practice was resumed in a limited form. "K.P.'s" were still detected for a further three months by slit-lamp. The affected eyeball did not take a static shape for another twelve months, and suitable all-purpose spectacles were not obtained until then.

In view of the presence of an epidemic of gastro-enteritis at the time that the iritis appeared, and the fact that the infection responded only slightly to cortisone and most favourably to chloramphenicol, and not at all to aspirin or penicillin, is it reasonable to postulate a theory of direct spread from patient to practitioner on this occasion?

Yours, etc.,

F. K. Bartlett, M.B., B.S.

Bulli,
New South Wales,
March 12, 1955.

P.S.—A similar condition was treated by the author twelve months ago with chloramphenicol, the three "A's" and dark glasses only. This man, aged thirty-three years, returned to full duties as an electrician three weeks later—without any residual disability.

AN UNUSUAL CASE OF INTESTINAL OBSTRUCTION.

Sir: Following a report of a case by Dr. Price in the journal of January 22, I have had a similar case which I think justifies publication.

A young woman, whilst attending my surgery with an infected finger, complained of severe abdominal pain, which failed to subside; and laparotomy proved it to be due to strangulation of bowel caused by the passing of the small intestine through a silver spring pessary, which had penetrated the uterus, and as in Mr. Price's case, was still attached to the fundus of the uterus. As in this instance the lady concerned had the good sense to have this catastrophe in my surgery and was then able to have prompt attention, the obstruction was relieved without recourse to excision of bowel. Recovery was uneventful.

As this is the second such case within six months in this town, where this method of contraception is not very prevalent, it further stresses the danger which may have been considered remote by some practitioners.

Yours, etc.,

John T. Irvine.

389 Canning Highway,
South Perth,
February 23, 1955.

THE DANGERS OF POTASSIUM PERMANGANATE.

Sir: Your subleader in The Medical Journal of Australia, January 29, 1955, on the "Dangers of Potassium Permanganate", following a similar article on the dangers of boracic acid, is, to say the least, very misleading.

Both these remedies, as you stated, have been in use for generations, and I cannot recall any accident when used in the normal way. The fact that they have been in use for so long and are still in use suggests that they are of considerable value. Because some irresponsible person used a concentrated solution with unfortunate results, there is no reason to condemn the article.

Dermatologists have used both potassium permanganate and boracic acid lotions extensively with excellent results; in addition they are far less likely to produce allergic states than many of the modern agents used for the same purpose.

Potassium permanganate is freely used by most dermatologists and particularly in children, both as a bath and lotion, and that alone suggests freedom from danger. It has a beneficial antipruritic effect as well as an undeniable antiseptic one.

In the case of boracic acid, the lay Press in Brisbane (*Courier-Mail*) took this up, and their article would give the impression that in using boracic acid people were handling a highly dangerous poison. It is unfortunate that two proven remedies should be discredited in this way.

For the Dermatological Association of Australia,
Yours, etc.,

B. B. Barrack,
President.

"Inchcolm",
Wickham Terrace,
Brisbane.
February 5, 1955.

MEDICAL DERMATITIS.

Sir: In 1942 a soldier had a small injury on his leg treated with local sulphonamide; a few days later he developed a severe dermatitis of the leg. In 1944 sulphonamide powder and friar's balsam were applied to his elbow for a minor lesion; again a severe local dermatitis resulted. Later, when in New Guinea, his dysentery was treated with sulphaguanidine; a generalized severe eruption promptly followed, which precluded further treatment with the sulphonamide. A few months ago a masseur applied friar's balsam to his arm; a hyperacute local dermatitis appeared within a few hours. A few weeks ago he used a proprietary gargle; an intense allergic reaction of the buccal and lingual mucosa followed promptly, denuding the mucosa almost entirely for a few days.

There is a similarity in molecular structure between benzoin, para-aminobenzoic acid (used in some sun-screen preparations), sulphonamides, many local anæsthetics and various hair dyes. Cross sensitization may occur between these and other related substances, so that an allergy developing to one may cause automatic sensitization to others. The consequences of such sensitization may obviously be serious.

There is no need to use sulphonamides on the skin at any time. This is probably also true of the conjunctival sac and the vagina as well. Local anæsthetics are almost as dangerous. There is little if any justification for the topical use of penicillin. Not only is it dangerous, but the antibiotic is almost useless against the common staphylococci.

It seems that so long as drug firms are peddling their sulphonamide-penicillin preparations for topical use, some members of the profession feel obliged to use them.

Yours, etc.,

Denis M. Clarke.

110 Collins Street,
Melbourne,
March 18, 1955.

AORTIC INCOMPETENCE IN A BOY WITH GROSS CALCIFICATION OF THE THORACIC AORTA.

Sir: I wish to report a case of aortic incompetence in a boy of eleven with gross calcification of the thoracic aorta, who was admitted to Townsville General Hospital on November 4, 1954.

The child had been well until two years of age, when he was knocked down by a car, following which he developed a generalized skin eruption which has persisted on and off ever since. He has lived a relatively normal child's activity. He is in Grade III at school, which is about two years behind children of his own age. Recently, he has noticed that he cannot run around at school as much as the other children because he "feels like vomiting". He occasionally has pain in his abdomen. He has been waking at night feeling breathless, and wants the window opened. He has not been cyanosed, nor has he experienced swelling of his feet. He has never had joint pains. He experiences occasional headaches, which respond to aspirin. He has always been small for his age. There are two other children in the family, aged four and two years, who are alive and well. Previous illnesses of the patient are non-contributory.

On examination, he was a small, frail-looking child, with eczema of body and limbs, mainly confined to flexures. He had slight bossing of his skull, and pulsating neck vessels.

The pulse rate was rapid (100 per minute), but regular in time and amplitude. There was a collapsing pulse present. The femoral pulse was easily palpable. The venous pressure was not raised. There was marked systolic pulsation of the right carotid artery and a systolic thrill on palpation. The blood pressure was 240 millimetres of mercury, systolic, and 70 millimetres, diastolic. The apex beat showed a systolic protrusion in the anterior axillary line in the fifth left intercostal space. The heart was enlarged to the left. Auscultation revealed a marked aortic diastolic murmur and a mitral mid-diastolic murmur. The respiratory, alimentary and central nervous systems were normal.

X-ray examination of the chest showed a large heart, dilated, with unfolded aorta and marked calcification confined to the arch of the aorta and along the descending aorta. An electrocardiogram showed increased voltage over the chest leads; otherwise the tracing was of an electrically normal horizontal heart. The result of a Kline test was negative. The hæmoglobin value was 10·0 grammes *per centum*. The red cells showed slight anisocytosis and polychromasia. The serum calcium content was 10·0 milligrammes per 100 millilitres. The plasma inorganic phosphate content was 3·8 milligrammes per 100 millilitres. The blood urea content was 20 milligrammes per 100 millilitres. The serum alkaline phosphatase content was 14 units.

Yours, etc.,

MICHAEL ELYAN.

Broken Hill,
New South Wales,
March 7, 1955.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE following have been registered, pursuant to the provisions of the *Medical Practitioners Act*, 1938-1953, as medical practitioners who are required to complete twelve months' hospital service in accordance with the provisions of Section 17 (3) of the Act (the degrees are, unless otherwise stated, in all cases M.B., B.S., 1955 (Univ. Sydney)): Symons, Michael Frank, M.B., B.S., 1954 (Univ. Melb.); Rosenberg, Samuel, registered in accordance with the provisions of Section 17 (1) (*c*) of the *Medical Practitioners Act*, 1938-1953; Anet, Denise Berthe Germaine; Annetts, David Lyle; Baldwin, Douglas Bernard; Barnett, Clive; Bell, David Samuel; Bell, John Michael; Beveridge, Bruce Robert; Biggs, James Crawford; Bishop, Warren Joseph; Blower, Charles Russell; Bodlander, Feder Max Serge; Boon, Peter Eric; Bradfield, Alan Harold; Bradley, Malcolm George; Brenner, Leonard; Breslin, Francis Hugh Dominic; Brookes, Ronald Alfred; Cable, Ronald Hughes; Campbell, Eric Charles; Carroll, Peter John; Channon, Pamela; Chapman, David Bruce; Chapman, George Keith; Chia, William; Clarkson, Joan Violet; Cleary, Edward George; Clifford, Arnold; Cole, David Ian; Collins, Frederick John; Connock, Richard Hugh Shephard; Cooper, Bryan Paul; Coulthurst, Keith Dudley; Cross, Janet Buchan; Cruikshank, Nellie Marian; Davey, Ronald Bruce; Davis, Douglas Barry; Don, Ronald Alexander; Douglas, Bruce Stuart; Edwards, Lawrence Alfred; Ehrlich, Frederick; Ellem, Kay Adrian Oswald; Elliott, Francis Maxwell; Elliott, Graeme Robert; Elmslie, Ronald Gordon; Elphick, Richard Lansdell; Ferguson, Peter Langbene; Fisher, Frank; Fisher, John Watt; Fitzgerald, Delicia Diana; Fitzgerald, Ronald Robert; Fletcher, Allan Lucas; Gallagher, Vera; Gallagher, William Terence; Georgouras, Katherine Evelyn; Gillies, Malcolm John; Glen, Donald Lochinvar; Glenn, David Campbell; Gordon, Kevin Frederick Joseph; Gye, Richard Spencer; Hansen, Peter John; Harrison, Gordon Alfred; Hart, Robert Mercer; Harvey, Francis John; Harvey, Patricia Mary; Harvey, Patrick Watson; Hasemer, Judith Winifred; Henson, Ross William; Holcombe, Maureen Ena; Holland, John Terence; Hudson, David Lindsay; Hughes, Leslie Ernest; Hughes, Peter Dalton; Hunt, John Francis; Ingle, Charles Bruce; Jefferis, John Elbury; Jeremy, David; Johnson, Frank Louis; Kan, Henry Tae-Wan; Kemp, John Francis; Klein, Douglas George; Korten, Susanne; Lang, Francis Houstoun; Learoyd, Brian Meldrum; Leckie, Thomson David; Leigh, Boyd Lionel Hilton; Levi, Louis; Lewis, John Blake Paviour; Llewellyn-Smith, Hazel May; Llewellyn-Smith, Ronald Leslie; Lloyd, Alan Murray; Lorang, John Erik; Loudon, Richard Derby Kingsford; McArthur, Richard James; McEwen, Brian William;

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED MARCH 19, 1955.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.[2]	Australia.[3]
Acute Rheumatism	6(6)	..	2(1)	1	..	..	..	..	9
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	11(11)	..	..	..	..	..	11
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	3(3)	7(7)	4(4)	..	..	..	..	..	14
Diphtheria	5(4)	5(5)	1(1)	1	7(7)	..	..	..	19
Dysentery (Bacillary)	..	7(7)	1(1)	..	..	..	1	..	9
Encephalitis	..	..	..	..	..	1	..	..	1
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	35(20)	121(102)	..	13(3)	3(2)	1	..	..	173
Lead Poisoning	..	..	1	..	..	..	..	..	1
Leprosy	..	..	..	..	..	..	..	..	..
Leptospirosis	..	..	10	..	..	..	..	..	10
Malaria	..	..	..	..	..	..	..	..	..
Meningococcal Infection	3(3)	..	3(3)	1(1)	1(1)	1(1)	..	..	9
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	1	..	..	..	..	..	..	..	1
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	16(7)	15(7)	12(1)	3(2)	..	..	..	..	46
Puerperal Fever	..	..	1	..	..	..	..	..	..
Rubella	..	21(13)	..	1	3(3)	..	..	..	25
Salmonella Infection	..	..	..	..	16(14)	..	..	..	16
Scarlet Fever	19(8)	36(25)	5	3(2)	1(1)	..	..	..	64
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	1	..	1(1)	..	..	..	..	2
Trachoma	..	..	..	..	5	..	..	..	5
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	36(21)	17(13)	21(9)	13(11)	11(7)	6(1)	1	..	105
Typhoid Fever	..	..	..	..	..	..	..	..	..
Typhus (Flea-, Mite- and Tick-borne)	..	..	3	..	1	..	..	..	4
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.
[2] Figures not available.
[3] Figures incomplete owing to absence of returns from the Australian Capital Territory.

Manners, David; Mar, Albert Vincent; Maxwell, Donald Charles; Mitchell, Lindsay; Mooy, Antony; Morgan, Graeme John; Morgan, John; Morgan, John Joseph; Munro, Lyle; Muntz, William McLaughlin; Muscio, Peter Allan; Muston, Jacqueline April; Newman, Rohma; Ng, Hein Wah Francis; Ng, Thomas Khoon-Fong; Nossal, Gustav Joseph Victor John; Oakley, June Rosalind Lytton; O'Riordan, Richard Joseph; Ormandy, Gordon James; O'Sullivan, Eugene Peter; Pacey, Spencer Milverton; Parer, Brian Michael; Paul, Leslie; Pearce, John Warren Boswell; Peasley, William John; Peters, Harry; Phillips, Richard Arthur Carlisle; Poate, William James; Porter, John Alfred; Preswick, George; Purser, Brian Normand; Quigley, Donald James; Rowe, Sydney Gale; Rowell, Charles Edward; Ryan, William Philip; Scougall, James Selwyn; Sgouromallis, John; Shanahan, Leo Francis; Shanahan, Mark Xavier; Shand, John Wentworth; Sheldon, Bruce Henry Gilbert; Shellshear, Michael Francis; Shenstone, David Beverley; Smith, Donald Wood; Solomon, Herbert John; Sporr, Walter Fritz; Stein, Brian William; Stevenson, George Telford; Stocks, John Graham; Taylor, Thomas Kinman Fardon; Tents, Reni Wiiu; Thomas, Edna Rae; Toh, Charles Chai Soon; Tooth, Richard Murray; Wake, Peter John; Wald, Marx; Walker, Alan Courtenay; Walker, Geoffrey Shepherd; Walker, Lindsay Ronald; Watson, John Glenton; Wee, William Soon Cheng; Whelan, James Joseph; Whitehouse, Cornelia Anne; Wiles, Angus Neil; Woods, William Edward; Woolard, Thomas John; Wright, James Edwin; Wright, John Saxon; Yee, Lawrence Radford; Yeo, Kean Seng; Yeomans, Neville Thomas; Young, Arthur Alwyn.

QUEENSLAND.

The following have been registered, pursuant to the provisions of *The Medical Acts*, 1939-1948, as duly qualified medical practitioners: Drake, John Barry, M.B., B.S., 1952 (Univ. Melbourne); Diethelm, Geoffrey, M.B., B.S., 1952 (Univ. Sydney); Gray, Ronald McKay, M.B., B.S., 1954 (Univ. Sydney); Wilson, Peter Charles McLeod, M.B., B.S., 1954 (Univ. Sydney); Cleeve, Noel Pitt, M.B., B.S., 1954 (Univ. Sydney); Sheppard, Frederick Augustus Berrill, M.B., B.S., 1929 (Univ. Melbourne), F.R.C.S. (Edinburgh), 1936; Appleby, Mary Louise, M.B., B.S., 1954 (Univ. Sydney).

The following additional qualifications have been registered: Dooley, Desmond James, D.Obst., R.C.O.G., 1950, M.R.C.O.G., 1954; Lindsay, William Edward, F.R.C.S. (Edinburgh), 1954; Zavattaro, Peter, D.P.M. (Melbourne), 1954; Hawkins, Warren, D.C.H. (London), 1954.

Notice.

VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

Section of Preventive Medicine.

The next meeting of the Section of Preventive Medicine of the Victorian Branch of the British Medical Association will be held in the Medical Society Hall, 426 Albert Street, East Melbourne, at 4.30 p.m. on Thursday, April 14, 1955. Dr. David Roseby will speak on "Health Education: An S O S for the General Practitioner". It is considered that this address will be of particular interest to all general practitioners. All members of the Branch are invited to be present.

Section of Industrial Medicine.

The next meeting of the Section of Industrial Medicine of the Victorian Branch of the British Medical Association will be held on Tuesday, April 19, 1955, at the Royal Melbourne Hospital. Mr. A. R. Wakefield, M.S., F.R.C.S., F.R.A.C.S., will speak on "The Management of Hand Injuries" and demonstrate cases. All interested members of the Branch and Section should assemble at Ward 7 West at 8 p.m.

Deaths.

The following deaths have been announced:

Bennett.—Harold Vincent Bennett, on March 20, 1955, at Prahran, Victoria.

Mobbs.—Athol Walter Mobbs, on March 21, 1955, at Sydney.

Diary for the Month.

April 12.—New South Wales Branch, B.M.A.: Organization and Science Committee.
April 12.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
April 15.—Queensland Branch, B.M.A.: Council Meeting.
April 18.—Victorian Branch, B.M.A.: Finance Subcommittee.
April 19.—New South Wales Branch, B.M.A.: Medical Politics Committee.
April 20.—Western Australian Branch, B.M.A.: General Meeting.
April 21.—Victorian Branch, B.M.A.: Executive of Branch Council.
April 21.—New South Wales Branch, B.M.A.: Clinical Meeting.

Medical Appointments.

Dr. T. Giblin has been appointed to the Board of the Hobart Public Hospitals District as a representative of the medical practitioners residing and practising in that district.

Dr. I. A. Shumack has been appointed an official visitor to Lachlan Park Hospital, New Norfolk, Tasmania.

Dr. W. J. W. Close has been appointed a member of the Dental Board of South Australia on the nomination of the British Medical Association.

Dr. D. J. Daly has been appointed medical registrar at the Royal Adelaide Hospital.

Dr. M. R. Hone has been appointed surgical registrar at the Royal Adelaide Hospital.

Medical Appointments: Important Notice.

Medical practitioners are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all contract practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to The Medical Journal of Australia alone, unless the contrary be stated.

All communications should be addressed to the Editor, The Medical Journal of Australia, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, The Medical Journal of Australia, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

Subscription Rates.—Medical students and others not receiving The Medical Journal of Australia in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 *per annum* within Australia and the British Commonwealth of Nations, and £6 10s. *per annum* within America and foreign countries, payable in advance.